

April 06, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424249

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424249

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Alaska Certification UST-107
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Nevada DCNR Certification #: MN000372018-1
Montana DHHS Certification #: CERT0102

Minnesota Dept of Health Certification #: 1382680
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424249001	FD-SB-A5(15-17)	Solid	03/20/18 13:00	03/20/18 16:55
10424249002	FD-SB-B5(11.5-23)	Solid	03/20/18 15:10	03/20/18 16:55

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10424249001	FD-SB-A5(15-17)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	LPM	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	JLR	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8270D	STB	12	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	AET1	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10424249002	FD-SB-B5(11.5-23)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	LPM			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	JLR			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8270D	STB			12	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	AET1			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: **FD-SB-A5(15-17)** Lab ID: **10424249001** Collected: 03/20/18 13:00 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	22.5	ng/g	13.1	1	03/30/18 11:35	04/02/18 16:46	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	309-00-2	
alpha-BHC	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	319-84-6	
beta-BHC	35.0	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	319-85-7	M6
delta-BHC	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	58-89-9	
Chlordane (Technical)	ND	ug/kg	246	10	03/21/18 11:50	04/02/18 20:15	57-74-9	
alpha-Chlordane	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	5103-71-9	
gamma-Chlordane	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	5103-74-2	
4,4'-DDD	ND	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	72-54-8	
4,4'-DDE	52.5	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	72-55-9	M6, R1
4,4'-DDT	ND	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	50-29-3	
Dieldrin	ND	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	60-57-1	
Endosulfan I	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	959-98-8	
Endosulfan II	ND	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	33213-65-9	
Endosulfan sulfate	ND	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	1031-07-8	M6, R1
Endrin	ND	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	72-20-8	
Endrin aldehyde	56.5	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	7421-93-4	M6, R1
Endrin ketone	50.8	ug/kg	49.0	10	03/21/18 11:50	04/02/18 20:15	53494-70-5	M6, R1
Heptachlor	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	76-44-8	
Heptachlor epoxide	ND	ug/kg	24.6	10	03/21/18 11:50	04/02/18 20:15	1024-57-3	
Methoxychlor	ND	ug/kg	246	10	03/21/18 11:50	04/02/18 20:15	72-43-5	
Toxaphene	ND	ug/kg	736	10	03/21/18 11:50	04/02/18 20:15	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	10	03/21/18 11:50	04/02/18 20:15	877-09-8	3M, D4, S4
Decachlorobiphenyl (S)	0	%.	30-150	10	03/21/18 11:50	04/02/18 20:15	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	53469-21-9	
PCB-1248 (Aroclor 1248)	394	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	12672-29-6	
PCB-1254 (Aroclor 1254)	293	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	11100-14-4	
PCB, Total	686	ug/kg	48.6	1	03/21/18 12:24	03/26/18 15:59	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	81	%.	48-125	1	03/21/18 12:24	03/26/18 15:59	877-09-8	
Decachlorobiphenyl (S)	93	%.	30-134	1	03/21/18 12:24	03/26/18 15:59	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-A5(15-17) **Lab ID: 10424249001** Collected: 03/20/18 13:00 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	4400	mg/kg	651	50	03/21/18 18:51	03/22/18 10:54		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	50	03/21/18 18:51	03/22/18 10:54	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	187	mg/kg	20.4	1	03/27/18 09:24	03/28/18 02:39		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	03/27/18 09:24	03/28/18 02:39	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	13600	mg/kg	71.5	5	03/21/18 04:13	03/23/18 15:47	7429-90-5	P6
Barium	547	mg/kg	3.6	5	03/21/18 04:13	03/23/18 15:47	7440-39-3	P6,R1
Boron	238	mg/kg	53.7	5	03/21/18 04:13	03/23/18 15:47	7440-42-8	M1
Copper	137	mg/kg	3.6	5	03/21/18 04:13	03/23/18 15:47	7440-50-8	M1,R1
Iron	99500	mg/kg	89.4	25	03/21/18 04:13	03/23/18 16:07	7439-89-6	P6,R1
Manganese	3260	mg/kg	8.9	25	03/21/18 04:13	03/23/18 16:07	7439-96-5	P6,R1
Nickel	1480	mg/kg	7.2	5	03/21/18 04:13	03/23/18 15:47	7440-02-0	P6,R1
Silver	ND	mg/kg	3.6	5	03/21/18 04:13	03/23/18 15:47	7440-22-4	D3
Tin	204	mg/kg	26.8	5	03/21/18 04:13	03/23/18 15:47	7440-31-5	M1
Titanium	240	mg/kg	8.9	5	03/21/18 04:13	03/23/18 15:47	7440-32-6	M1,R1
Zinc	3030	mg/kg	7.2	5	03/21/18 04:13	03/23/18 15:47	7440-66-6	P6,R1
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	215	mg/kg	2.8	10	03/30/18 09:43	03/31/18 06:41	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	41.0	mg/kg	0.73	20	03/21/18 04:13	03/21/18 12:39	7440-36-0	M6,R1
Arsenic	19.0	mg/kg	0.73	20	03/21/18 04:13	03/21/18 12:39	7440-38-2	
Beryllium	ND	mg/kg	0.29	20	03/21/18 04:13	03/21/18 12:39	7440-41-7	
Cadmium	6.2	mg/kg	0.12	20	03/21/18 04:13	03/21/18 12:39	7440-43-9	
Cobalt	22.8	mg/kg	0.73	20	03/21/18 04:13	03/21/18 12:39	7440-48-4	M6
Lead	453	mg/kg	0.15	20	03/21/18 04:13	03/21/18 12:39	7439-92-1	M6,R1
Lithium	5.1	mg/kg	0.73	20	03/21/18 04:13	03/21/18 12:39	7439-93-2	
Selenium	ND	mg/kg	0.73	20	03/21/18 04:13	03/21/18 12:39	7782-49-2	
Strontium	68.5	mg/kg	0.73	20	03/21/18 04:13	03/21/18 12:39	7440-24-6	M6,R1
Vanadium	22.6	mg/kg	1.5	20	03/21/18 04:13	03/21/18 12:39	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	9.4	mg/kg	0.26	10	03/21/18 04:05	03/21/18 16:00	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	32.2	%	0.10	1		03/21/18 11:05		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: **FD-SB-A5(15-17)** Lab ID: **10424249001** Collected: 03/20/18 13:00 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	208-96-8	
Anthracene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	120-12-7	
Benzo(a)anthracene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	56-55-3	
Benzo(a)pyrene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	101-55-3	
Butylbenzylphthalate	2630	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	85-68-7	M1
Carbazole	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	59-50-7	
4-Chloroaniline	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	91-58-7	
2-Chlorophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	7005-72-3	
Chrysene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	53-70-3	
Dibenzofuran	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	120-83-2	
Diethylphthalate	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	105-67-9	
Dimethylphthalate	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	131-11-3	
Di-n-butylphthalate	2450	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	84-74-2	M1
4,6-Dinitro-2-methylphenol	ND	ug/kg	12500	5	03/21/18 18:56	03/31/18 22:32	534-52-1	M1
2,4-Dinitrophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	51-28-5	M1
2,4-Dinitrotoluene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	606-20-2	
Di-n-octylphthalate	4800	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	117-84-0	M1,R1
1,2-Diphenylhydrazine	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	122-66-7	
bis(2-Ethylhexyl)phthalate	483000	ug/kg	121000	250	03/21/18 18:56	04/03/18 12:33	117-81-7	M1,R1
Fluoranthene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	206-44-0	
Fluorene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	87-68-3	
Hexachlorobenzene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	118-74-1	
Hexachloroethane	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	193-39-5	
Isophorone	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-A5(15-17) **Lab ID: 10424249001** Collected: 03/20/18 13:00 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	4850	5	03/21/18 18:56	03/31/18 22:32		
Naphthalene	2940	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	91-20-3	M1
2-Nitroaniline	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	88-74-4	
3-Nitroaniline	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	99-09-2	
4-Nitroaniline	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	100-01-6	
Nitrobenzene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	98-95-3	
2-Nitrophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	88-75-5	
4-Nitrophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	86-30-6	
Pentachlorophenol	ND	ug/kg	4920	5	03/21/18 18:56	03/31/18 22:32	87-86-5	
Phenanthrene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	85-01-8	
Phenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	108-95-2	
Pyrene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2420	5	03/21/18 18:56	03/31/18 22:32	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	79	%	43-125	5	03/21/18 18:56	03/31/18 22:32	4165-60-0	D4
2-Fluorobiphenyl (S)	75	%	30-132	5	03/21/18 18:56	03/31/18 22:32	321-60-8	
p-Terphenyl-d14 (S)	74	%	62-125	5	03/21/18 18:56	03/31/18 22:32	1718-51-0	
Phenol-d6 (S)	80	%	48-125	5	03/21/18 18:56	03/31/18 22:32	13127-88-3	
2-Fluorophenol (S)	69	%	40-125	5	03/21/18 18:56	03/31/18 22:32	367-12-4	
2,4,6-Tribromophenol (S)	73	%	60-125	5	03/21/18 18:56	03/31/18 22:32	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	546	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	83-32-9	
Acenaphthylene	ND	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	208-96-8	
Anthracene	252	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	120-12-7	
Benzo(a)anthracene	206	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	56-55-3	
Benzo(a)pyrene	215	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	50-32-8	
Benzo(b)fluoranthene	367	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	205-99-2	
Benzo(g,h,i)perylene	282	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	191-24-2	
Benzo(k)fluoranthene	130	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	207-08-9	
Chrysene	450	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	218-01-9	
Dibenz(a,h)anthracene	87.3	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	53-70-3	
Fluoranthene	853	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	206-44-0	
Fluorene	928	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	86-73-7	
Indeno(1,2,3-cd)pyrene	210	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	193-39-5	
Naphthalene	2300	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	91-20-3	
Phenanthrene	1840	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	85-01-8	
Pyrene	655	ug/kg	73.5	5	03/21/18 09:04	03/22/18 22:14	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%	42-125	5	03/21/18 09:04	03/22/18 22:14	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-A5(15-17) **Lab ID: 10424249001** Collected: 03/20/18 13:00 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
p-Terphenyl-d14 (S)	100	%.	57-125	5	03/21/18 09:04	03/22/18 22:14	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	25057-89-0	R1
2,4-D	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	94-75-7	M1
2,4-DB	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	94-82-6	
Dicamba	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	1918-00-9	
Dinoseb	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	88-85-7	
MCPA	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	94-74-6	
Pentachlorophenol	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	87-86-5	
Picloram	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	1918-02-1	M1
2,4,5-T	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	93-72-1	
Triclopyr	ND	mg/kg	0.48	5	03/23/18 07:54	03/29/18 15:57	55335-06-3	
Surrogates								
2,4-DCAA (S)	64	%.	46-125	5	03/23/18 07:54	03/29/18 15:57	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	2860	1	03/26/18 09:03	03/26/18 11:30	67-64-1	
Allyl chloride	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	107-05-1	
Benzene	981	ug/kg	57.1	1	03/26/18 09:03	03/26/18 11:30	71-43-2	
Bromobenzene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	108-86-1	
Bromochloromethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	74-97-5	
Bromodichloromethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	75-27-4	
Bromoform	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	75-25-2	
Bromomethane	ND	ug/kg	1430	1	03/26/18 09:03	03/26/18 11:30	74-83-9	
2-Butanone (MEK)	ND	ug/kg	714	1	03/26/18 09:03	03/26/18 11:30	78-93-3	
n-Butylbenzene	1950	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	104-51-8	
sec-Butylbenzene	1510	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	135-98-8	
tert-Butylbenzene	488	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	98-06-6	
Carbon tetrachloride	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	56-23-5	
Chlorobenzene	479	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	108-90-7	
Chloroethane	ND	ug/kg	1430	1	03/26/18 09:03	03/26/18 11:30	75-00-3	
Chloroform	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	67-66-3	
Chloromethane	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	74-87-3	
2-Chlorotoluene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	95-49-8	
4-Chlorotoluene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1430	1	03/26/18 09:03	03/26/18 11:30	96-12-8	
Dibromochloromethane	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	106-93-4	
Dibromomethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	74-95-3	
1,2-Dichlorobenzene	435	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	541-73-1	
1,4-Dichlorobenzene	1690	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	75-71-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: **FD-SB-A5(15-17)** Lab ID: **10424249001** Collected: 03/20/18 13:00 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1-Dichloroethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	75-34-3	
1,2-Dichloroethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	107-06-2	
1,1-Dichloroethene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1430	1	03/26/18 09:03	03/26/18 11:30	75-43-4	
1,2-Dichloropropane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	78-87-5	
1,3-Dichloropropane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	142-28-9	
2,2-Dichloropropane	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	594-20-7	
1,1-Dichloropropene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	60-29-7	
Ethylbenzene	6520	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	714	1	03/26/18 09:03	03/26/18 11:30	87-68-3	
Isopropylbenzene (Cumene)	1880	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	98-82-8	
p-Isopropyltoluene	882	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	99-87-6	
Methylene Chloride	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	714	1	03/26/18 09:03	03/26/18 11:30	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	1634-04-4	
Naphthalene	7650	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	91-20-3	
n-Propylbenzene	2480	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	103-65-1	
Styrene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	79-34-5	N2
Tetrachloroethene	741	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	127-18-4	
Tetrahydrofuran	ND	ug/kg	5710	1	03/26/18 09:03	03/26/18 11:30	109-99-9	
Toluene	3680	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	79-00-5	
Trichloroethene	ND	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	571	1	03/26/18 09:03	03/26/18 11:30	76-13-1	
1,2,4-Trimethylbenzene	4970	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	95-63-6	
1,3,5-Trimethylbenzene	1130	ug/kg	143	1	03/26/18 09:03	03/26/18 11:30	108-67-8	
Vinyl chloride	ND	ug/kg	57.1	1	03/26/18 09:03	03/26/18 11:30	75-01-4	
Xylene (Total)	7840	ug/kg	428	1	03/26/18 09:03	03/26/18 11:30	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1	03/26/18 09:03	03/26/18 11:30	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/26/18 09:03	03/26/18 11:30	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	03/26/18 09:03	03/26/18 11:30	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-A5(15-17) **Lab ID: 10424249001** Collected: 03/20/18 13:00 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	29.6	10	03/30/18 14:00	04/03/18 11:10	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	215	mg/kg	1.0	1		04/03/18 15:25	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	2.2	mg/kg	0.60	1	03/29/18 10:55	03/29/18 12:51	57-12-5	M0,R1
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	1.0	1	03/30/18 14:00	03/31/18 02:27	16984-48-8	

Sample: FD-SB-B5(11.5-23) **Lab ID: 10424249002** Collected: 03/20/18 15:10 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	39.4	1	03/30/18 11:35	04/02/18 17:19	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	309-00-2	
alpha-BHC	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	319-84-6	
beta-BHC	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	319-85-7	
delta-BHC	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	58-89-9	
Chlordane (Technical)	ND	ug/kg	292	5	03/21/18 11:50	04/02/18 21:46	57-74-9	
alpha-Chlordane	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	5103-71-9	
gamma-Chlordane	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	5103-74-2	
4,4'-DDD	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	72-54-8	
4,4'-DDE	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	72-55-9	
4,4'-DDT	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	50-29-3	
Dieldrin	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	60-57-1	
Endosulfan I	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	959-98-8	
Endosulfan II	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	33213-65-9	
Endosulfan sulfate	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	1031-07-8	
Endrin	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	72-20-8	
Endrin aldehyde	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	7421-93-4	
Endrin ketone	ND	ug/kg	58.1	5	03/21/18 11:50	04/02/18 21:46	53494-70-5	
Heptachlor	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	76-44-8	
Heptachlor epoxide	ND	ug/kg	29.2	5	03/21/18 11:50	04/02/18 21:46	1024-57-3	
Methoxychlor	ND	ug/kg	292	5	03/21/18 11:50	04/02/18 21:46	72-43-5	
Toxaphene	ND	ug/kg	873	5	03/21/18 11:50	04/02/18 21:46	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	100	%.	30-150	5	03/21/18 11:50	04/02/18 21:46	877-09-8	4M,D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Sample Project No.: 10424249

Sample: FD-SB-B5(11.5-23) **Lab ID:** 10424249002 Collected: 03/20/18 15:10 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	93	%.	30-150	5	03/21/18 11:50	04/02/18 21:46	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	11100-14-4	
PCB, Total	ND	ug/kg	116	1	03/21/18 12:24	03/26/18 16:14	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	92	%.	48-125	1	03/21/18 12:24	03/26/18 16:14	877-09-8	
Decachlorobiphenyl (S)	92	%.	30-134	1	03/21/18 12:24	03/26/18 16:14	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	71.0	mg/kg	33.6	1	03/21/18 18:51	03/22/18 10:47		T6
Surrogates								
n-Triacontane (S)	86	%.	50-150	1	03/21/18 18:51	03/22/18 10:47	638-68-6	
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	52.1	1	03/27/18 09:24	03/28/18 03:03		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	03/27/18 09:24	03/28/18 03:03	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3030	mg/kg	33.4	1	03/21/18 04:13	03/23/18 15:44	7429-90-5	
Barium	174	mg/kg	1.7	1	03/21/18 04:13	03/23/18 15:44	7440-39-3	
Boron	296	mg/kg	25.0	1	03/21/18 04:13	03/23/18 15:44	7440-42-8	
Copper	11.4	mg/kg	1.7	1	03/21/18 04:13	03/23/18 15:44	7440-50-8	
Iron	13600	mg/kg	8.3	1	03/21/18 04:13	03/23/18 15:44	7439-89-6	
Manganese	435	mg/kg	0.83	1	03/21/18 04:13	03/23/18 15:44	7439-96-5	
Nickel	13.3	mg/kg	3.3	1	03/21/18 04:13	03/23/18 15:44	7440-02-0	
Silver	ND	mg/kg	1.7	1	03/21/18 04:13	03/23/18 15:44	7440-22-4	
Tin	ND	mg/kg	12.5	1	03/21/18 04:13	03/23/18 15:44	7440-31-5	
Titanium	87.3	mg/kg	4.2	1	03/21/18 04:13	03/23/18 15:44	7440-32-6	
Zinc	38.0	mg/kg	3.3	1	03/21/18 04:13	03/23/18 15:44	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	6.4	mg/kg	3.4	5	03/30/18 09:43	03/31/18 04:43	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-B5(11.5-23) **Lab ID: 10424249002** Collected: 03/20/18 15:10 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	ND	mg/kg	1.7	20	03/21/18 04:13	03/21/18 12:30	7440-36-0	
Arsenic	9.7	mg/kg	1.7	20	03/21/18 04:13	03/21/18 12:30	7440-38-2	
Beryllium	ND	mg/kg	0.67	20	03/21/18 04:13	03/21/18 12:30	7440-41-7	
Cadmium	0.37	mg/kg	0.27	20	03/21/18 04:13	03/21/18 12:30	7440-43-9	
Cobalt	7.9	mg/kg	1.7	20	03/21/18 04:13	03/21/18 12:30	7440-48-4	
Lead	4.9	mg/kg	0.33	20	03/21/18 04:13	03/21/18 12:30	7439-92-1	
Lithium	2.5	mg/kg	1.7	20	03/21/18 04:13	03/21/18 12:30	7439-93-2	
Selenium	1.8	mg/kg	1.7	20	03/21/18 04:13	03/21/18 12:30	7782-49-2	
Strontium	47.7	mg/kg	1.7	20	03/21/18 04:13	03/21/18 12:30	7440-24-6	
Vanadium	19.2	mg/kg	3.3	20	03/21/18 04:13	03/21/18 12:30	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	ND	mg/kg	0.066	1	03/21/18 04:05	03/21/18 15:46	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	71.5	%	0.10	1		03/21/18 11:05		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	83-32-9	
Acenaphthylene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	208-96-8	
Anthracene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	120-12-7	
Benzo(a)anthracene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	56-55-3	
Benzo(a)pyrene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	101-55-3	
Butylbenzylphthalate	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	85-68-7	
Carbazole	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	59-50-7	
4-Chloroaniline	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	108-60-1	
2-Chloronaphthalene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	91-58-7	
2-Chlorophenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	7005-72-3	
Chrysene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	53-70-3	
Dibenzofuran	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-B5(11.5-23) **Lab ID: 10424249002** Collected: 03/20/18 15:10 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Diethylphthalate	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	105-67-9	
Dimethylphthalate	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	131-11-3	
Di-n-butylphthalate	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	5950	1	03/21/18 18:56	03/31/18 21:33	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	606-20-2	
Di-n-octylphthalate	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	117-81-7	
Fluoranthene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	206-44-0	
Fluorene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	87-68-3	
Hexachlorobenzene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	118-74-1	
Hexachloroethane	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	193-39-5	
Isophorone	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	78-59-1	
1-Methylnaphthalene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	90-12-0	
2-Methylnaphthalene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	2310	1	03/21/18 18:56	03/31/18 21:33		
Naphthalene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	91-20-3	
2-Nitroaniline	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	88-74-4	
3-Nitroaniline	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	99-09-2	
4-Nitroaniline	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	100-01-6	
Nitrobenzene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	98-95-3	
2-Nitrophenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	88-75-5	
4-Nitrophenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	86-30-6	
Pentachlorophenol	ND	ug/kg	2340	1	03/21/18 18:56	03/31/18 21:33	87-86-5	
Phenanthrene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	85-01-8	
Phenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	108-95-2	
Pyrene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	1150	1	03/21/18 18:56	03/31/18 21:33	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	66	%	43-125	1	03/21/18 18:56	03/31/18 21:33	4165-60-0	
2-Fluorobiphenyl (S)	76	%	30-132	1	03/21/18 18:56	03/31/18 21:33	321-60-8	
p-Terphenyl-d14 (S)	91	%	62-125	1	03/21/18 18:56	03/31/18 21:33	1718-51-0	
Phenol-d6 (S)	70	%	48-125	1	03/21/18 18:56	03/31/18 21:33	13127-88-3	
2-Fluorophenol (S)	66	%	40-125	1	03/21/18 18:56	03/31/18 21:33	367-12-4	
2,4,6-Tribromophenol (S)	86	%	60-125	1	03/21/18 18:56	03/31/18 21:33	118-79-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-B5(11.5-23) **Lab ID: 10424249002** Collected: 03/20/18 15:10 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	2330	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	83-32-9	
Acenaphthylene	305	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	208-96-8	
Anthracene	ND	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	120-12-7	
Benzo(a)anthracene	261	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	56-55-3	
Benzo(a)pyrene	1850	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	50-32-8	
Benzo(b)fluoranthene	495	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	205-99-2	
Benzo(g,h,i)perylene	7000	ug/kg	349	10	03/21/18 09:04	03/23/18 12:40	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	207-08-9	
Chrysene	239	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	53-70-3	
Fluoranthene	2370	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	206-44-0	
Fluorene	870	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	86-73-7	
Indeno(1,2,3-cd)pyrene	1450	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	193-39-5	
Naphthalene	619	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	91-20-3	
Phenanthrene	1320	ug/kg	175	5	03/21/18 09:04	03/22/18 22:38	85-01-8	
Pyrene	7970	ug/kg	349	10	03/21/18 09:04	03/23/18 12:40	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	87	%.	42-125	5	03/21/18 09:04	03/22/18 22:38	321-60-8	D3
p-Terphenyl-d14 (S)	97	%.	57-125	5	03/21/18 09:04	03/22/18 22:38	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	25057-89-0	
2,4-D	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	94-75-7	
2,4-DB	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	94-82-6	
Dicamba	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	1918-00-9	
Dinoseb	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	88-85-7	
MCPA	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	94-74-6	
Pentachlorophenol	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	87-86-5	
Picloram	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	1918-02-1	
2,4,5-T	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	93-72-1	
Triclopyr	ND	mg/kg	1.2	5	03/23/18 07:54	03/29/18 16:41	55335-06-3	
Surrogates								
2,4-DCAA (S)	68	%.	46-125	5	03/23/18 07:54	03/29/18 16:41	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	6200	1	03/26/18 09:03	03/26/18 11:47	67-64-1	
Allyl chloride	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	107-05-1	
Benzene	277	ug/kg	124	1	03/26/18 09:03	03/26/18 11:47	71-43-2	
Bromobenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	108-86-1	
Bromochloromethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	74-97-5	
Bromodichloromethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	75-27-4	
Bromoform	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	75-25-2	
Bromomethane	ND	ug/kg	3100	1	03/26/18 09:03	03/26/18 11:47	74-83-9	
2-Butanone (MEK)	ND	ug/kg	1550	1	03/26/18 09:03	03/26/18 11:47	78-93-3	
n-Butylbenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-B5(11.5-23) **Lab ID: 10424249002** Collected: 03/20/18 15:10 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
sec-Butylbenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	135-98-8	
tert-Butylbenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	98-06-6	
Carbon tetrachloride	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	56-23-5	
Chlorobenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	108-90-7	
Chloroethane	ND	ug/kg	3100	1	03/26/18 09:03	03/26/18 11:47	75-00-3	
Chloroform	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	67-66-3	
Chloromethane	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	74-87-3	
2-Chlorotoluene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	95-49-8	
4-Chlorotoluene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	3100	1	03/26/18 09:03	03/26/18 11:47	96-12-8	
Dibromochloromethane	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	106-93-4	
Dibromomethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	75-71-8	
1,1-Dichloroethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	75-34-3	
1,2-Dichloroethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	107-06-2	
1,1-Dichloroethene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	156-60-5	
Dichlorofluoromethane	ND	ug/kg	3100	1	03/26/18 09:03	03/26/18 11:47	75-43-4	
1,2-Dichloropropane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	78-87-5	
1,3-Dichloropropane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	142-28-9	
2,2-Dichloropropane	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	594-20-7	
1,1-Dichloropropene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	60-29-7	
Ethylbenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	1550	1	03/26/18 09:03	03/26/18 11:47	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	98-82-8	
p-Isopropyltoluene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	99-87-6	
Methylene Chloride	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	1550	1	03/26/18 09:03	03/26/18 11:47	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	1634-04-4	
Naphthalene	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	91-20-3	
n-Propylbenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	103-65-1	
Styrene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	79-34-5	N2
Tetrachloroethene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	127-18-4	
Tetrahydrofuran	ND	ug/kg	12400	1	03/26/18 09:03	03/26/18 11:47	109-99-9	
Toluene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Sample: FD-SB-B5(11.5-23) **Lab ID: 10424249002** Collected: 03/20/18 15:10 Received: 03/20/18 16:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,4-Trichlorobenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	79-00-5	
Trichloroethene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 11:47	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 11:47	108-67-8	
Vinyl chloride	ND	ug/kg	124	1	03/26/18 09:03	03/26/18 11:47	75-01-4	
Xylene (Total)	ND	ug/kg	930	1	03/26/18 09:03	03/26/18 11:47	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1	03/26/18 09:03	03/26/18 11:47	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1	03/26/18 09:03	03/26/18 11:47	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	03/26/18 09:03	03/26/18 11:47	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	139	20	03/30/18 14:00	04/03/18 11:10	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	6.4	mg/kg	1.0	1		04/03/18 15:25	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.96	1	03/29/18 10:55	03/29/18 12:59	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.98	1	03/30/18 14:00	03/31/18 02:47	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424249

QC Batch: 139779 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 553598 Matrix: Solid
Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/02/18 14:39	N3

METHOD BLANK: 553599 Matrix: Solid
Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/02/18 14:46	N3

METHOD BLANK: 553600 Matrix: Solid
Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.19	04/02/18 14:52	N3

LABORATORY CONTROL SAMPLE: 553601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	109	105	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553602 553603

Parameter	Units	10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	22.5	480	482	389	390	76	76	65-135	0	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553604 553605

Parameter	Units	10424609001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	1000	932	788	743	79	80	65-135	6	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424249

QC Batch: 529097 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2871492 Matrix: Solid
Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	03/27/18 19:50	
a,a,a-Trifluorotoluene (S)	%.	100	80-150	03/27/18 19:50	

LABORATORY CONTROL SAMPLE & LCSD: 2871493

Parameter	Units	2871494								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Gasoline Range Organics	mg/kg	50	44.0	45.8	88	92	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%.				99	100	80-150			

MATRIX SPIKE SAMPLE: 2871826

Parameter	Units	10424835001						Qualifiers
		Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	RPD	
Gasoline Range Organics	mg/kg	ND	51.9	59.4	114	80-120		
a,a,a-Trifluorotoluene (S)	%.				100	80-150		

SAMPLE DUPLICATE: 2871827

Parameter	Units	10424835003				Qualifiers
		Result	Dup Result	RPD	Max RPD	
Gasoline Range Organics	mg/kg	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%.	100	99	2		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528273

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867291

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	03/21/18 15:21	

LABORATORY CONTROL SAMPLE: 2867292

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.52	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867293 2867294

Parameter	Units	10424135001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	mg/kg	0.17	.5	.47	0.70	0.63	106	99	80-120	9	20				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528272 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867287 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.8	03/23/18 15:23	
Barium	mg/kg	ND	0.49	03/23/18 15:23	
Boron	mg/kg	ND	7.4	03/23/18 15:23	
Copper	mg/kg	ND	0.49	03/23/18 15:23	
Iron	mg/kg	ND	2.5	03/23/18 15:23	
Manganese	mg/kg	ND	0.25	03/23/18 15:23	
Nickel	mg/kg	ND	0.98	03/23/18 15:23	
Silver	mg/kg	ND	0.49	03/23/18 15:23	
Tin	mg/kg	ND	3.7	03/23/18 15:23	
Titanium	mg/kg	ND	1.2	03/23/18 15:23	
Zinc	mg/kg	ND	0.98	03/23/18 15:23	

LABORATORY CONTROL SAMPLE: 2867288

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	962	975	101	80-120	
Barium	mg/kg	48.1	52.1	108	80-120	
Boron	mg/kg	48.1	47.0	98	80-120	
Copper	mg/kg	48.1	48.9	102	80-120	
Iron	mg/kg	962	1020	106	80-120	
Manganese	mg/kg	48.1	52.2	108	80-120	
Nickel	mg/kg	48.1	51.3	107	80-120	
Silver	mg/kg	24	23.9	99	80-120	
Tin	mg/kg	48.1	51.7	108	80-120	
Titanium	mg/kg	48.1	51.4	107	80-120	
Zinc	mg/kg	48.1	51.9	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867289 2867290

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424249001 Result	Spike Conc.	Spike Conc.	Result							
Aluminum	mg/kg	13600	1470	1390	8780	10600	-324	-212	75-125	19	20	P6
Barium	mg/kg	547	73.7	69.6	897	549	476	3	75-125	48	20	P6,R1
Boron	mg/kg	238	73.7	69.6	233	280	-7	60	75-125	18	20	M1
Copper	mg/kg	137	73.7	69.6	605	239	634	146	75-125	87	20	M1,R1
Iron	mg/kg	99500	1470	1390	442000	157000	23200	4150	75-125	95	20	P6,R1
Manganese	mg/kg	3260	73.7	69.6	4550	3600	1750	481	75-125	23	20	P6,R1
Nickel	mg/kg	1480	73.7	69.6	946	1620	-728	192	75-125	52	20	P6,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Parameter	Units	2867289		2867290		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
		10424249001 Result	MS Spike Conc.	MSD Spike Conc.	RPD						RPD		
Silver	mg/kg	ND	36.8	34.8	38.4	36.5	103	104	75-125	5	20		
Tin	mg/kg	204	73.7	69.6	402	456	269	363	75-125	13	20	M1	
Titanium	mg/kg	240	73.7	69.6	200	301	-55	88	75-125	40	20	M1, R1	
Zinc	mg/kg	3030	73.7	69.6	2600	8400	-594	7720	75-125	106	20	P6, R1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 434613

Analysis Method: EPA 6020

QC Batch Method: EPA 3050B

Analysis Description: 6020 MET

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2007430

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	03/31/18 04:29	N2

LABORATORY CONTROL SAMPLE: 2007431

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.6	97	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2007432 2007433

Parameter	Units	2007432		2007433		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424609003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	31.2	4.74	4.74	36.1	22.7	103	-179	75-125	46	20 1M, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528270 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867279 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.49	03/21/18 12:26	
Arsenic	mg/kg	ND	0.49	03/21/18 12:26	
Beryllium	mg/kg	ND	0.19	03/21/18 12:26	
Cadmium	mg/kg	ND	0.078	03/21/18 12:26	
Cobalt	mg/kg	ND	0.49	03/21/18 12:26	
Lead	mg/kg	ND	0.097	03/21/18 12:26	
Lithium	mg/kg	ND	0.49	03/21/18 12:26	
Selenium	mg/kg	ND	0.49	03/21/18 12:26	
Strontium	mg/kg	ND	0.49	03/21/18 12:26	
Vanadium	mg/kg	ND	0.97	03/21/18 12:26	

LABORATORY CONTROL SAMPLE: 2867280

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49.5	49.2	99	80-120	
Arsenic	mg/kg	49.5	48.9	99	80-120	
Beryllium	mg/kg	49.5	47.5	96	80-120	
Cadmium	mg/kg	49.5	49.2	99	80-120	
Cobalt	mg/kg	49.5	50.3	102	80-120	
Lead	mg/kg	49.5	50.6	102	80-120	
Lithium	mg/kg	49.5	48.2	97	80-120	
Selenium	mg/kg	49.5	49.0	99	80-120	
Strontium	mg/kg	49.5	48.1	97	80-120	
Vanadium	mg/kg	49.5	50.5	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867281 2867282

Parameter	Units	10424249001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Antimony	mg/kg	41.0	73	73.7	110	61.3	94	28	75-125	57	20	M6,R1	
Arsenic	mg/kg	19.0	73	73.7	81.5	77.3	86	79	75-125	5	20		
Beryllium	mg/kg	ND	73	73.7	70.2	69.8	96	94	75-125	1	20		
Cadmium	mg/kg	6.2	73	73.7	74.0	77.3	93	96	75-125	4	20		
Cobalt	mg/kg	22.8	73	73.7	87.2	77.3	88	74	75-125	12	20	M6	
Lead	mg/kg	453	73	73.7	333	600	-165	199	75-125	57	20	M6,R1	
Lithium	mg/kg	5.1	73	73.7	75.1	79.9	96	101	75-125	6	20		
Selenium	mg/kg	ND	73	73.7	68.1	70.1	92	94	75-125	3	20		
Strontium	mg/kg	68.5	73	73.7	131	441	85	505	75-125	109	20	M6,R1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424249

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2867281		2867282								
Parameter	Units	10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Vanadium	mg/kg	22.6	73	73.7	101	96.5	107	100	75-125	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528315

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10424249001, 10424249002

SAMPLE DUPLICATE: 2867413

Parameter	Units	10424258003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	23.6	23.4	1	30	

SAMPLE DUPLICATE: 2867479

Parameter	Units	10424228001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.3	13.8	4	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528973

Analysis Method: EPA 8260B

QC Batch Method: EPA 5035/5030B

Analysis Description: 8260B MSV 5030 Med Level

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2871002

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/26/18 10:56	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/26/18 10:56	
1,1-Dichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
1,1-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,3-Trichloropropane	ug/kg	ND	200	03/26/18 10:56	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/26/18 10:56	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichloropropane	ug/kg	ND	50.0	03/26/18 10:56	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,3-Dichloropropane	ug/kg	ND	50.0	03/26/18 10:56	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
2,2-Dichloropropane	ug/kg	ND	200	03/26/18 10:56	
2-Butanone (MEK)	ug/kg	ND	250	03/26/18 10:56	
2-Chlorotoluene	ug/kg	ND	50.0	03/26/18 10:56	
4-Chlorotoluene	ug/kg	ND	50.0	03/26/18 10:56	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/26/18 10:56	
Acetone	ug/kg	ND	1000	03/26/18 10:56	
Allyl chloride	ug/kg	ND	200	03/26/18 10:56	
Benzene	ug/kg	ND	20.0	03/26/18 10:56	
Bromobenzene	ug/kg	ND	50.0	03/26/18 10:56	
Bromochloromethane	ug/kg	ND	50.0	03/26/18 10:56	
Bromodichloromethane	ug/kg	ND	50.0	03/26/18 10:56	
Bromoform	ug/kg	ND	200	03/26/18 10:56	
Bromomethane	ug/kg	ND	500	03/26/18 10:56	
Carbon tetrachloride	ug/kg	ND	50.0	03/26/18 10:56	
Chlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
Chloroethane	ug/kg	ND	500	03/26/18 10:56	
Chloroform	ug/kg	ND	50.0	03/26/18 10:56	
Chloromethane	ug/kg	ND	200	03/26/18 10:56	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

METHOD BLANK: 2871002

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/26/18 10:56	
Dibromomethane	ug/kg	ND	50.0	03/26/18 10:56	
Dichlorodifluoromethane	ug/kg	ND	200	03/26/18 10:56	
Dichlorofluoromethane	ug/kg	ND	500	03/26/18 10:56	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/26/18 10:56	
Ethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/26/18 10:56	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/26/18 10:56	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/26/18 10:56	
Methylene Chloride	ug/kg	ND	200	03/26/18 10:56	
n-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
n-Propylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Naphthalene	ug/kg	ND	200	03/26/18 10:56	
p-Isopropyltoluene	ug/kg	ND	50.0	03/26/18 10:56	
sec-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Styrene	ug/kg	ND	50.0	03/26/18 10:56	
tert-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Tetrachloroethene	ug/kg	ND	50.0	03/26/18 10:56	
Tetrahydrofuran	ug/kg	ND	2000	03/26/18 10:56	
Toluene	ug/kg	ND	50.0	03/26/18 10:56	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	
Trichloroethene	ug/kg	ND	50.0	03/26/18 10:56	N2
Trichlorofluoromethane	ug/kg	ND	200	03/26/18 10:56	
Vinyl chloride	ug/kg	ND	20.0	03/26/18 10:56	
Xylene (Total)	ug/kg	ND	150	03/26/18 10:56	
1,2-Dichloroethane-d4 (S)	%	90	75-125	03/26/18 10:56	
4-Bromofluorobenzene (S)	%	99	75-125	03/26/18 10:56	
Toluene-d8 (S)	%	98	75-125	03/26/18 10:56	

LABORATORY CONTROL SAMPLE & LCSD: 2871003

2871004

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	828	958	83	96	59-125	15	20	
1,1,1-Trichloroethane	ug/kg	1000	802	933	80	93	59-125	15	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	803	971	80	97	58-125	19	20	N2
1,1,2-Trichloroethane	ug/kg	1000	778	897	78	90	64-125	14	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	776	922	78	92	65-125	17	20	
1,1-Dichloroethane	ug/kg	1000	754	861	75	86	63-125	13	20	
1,1-Dichloroethene	ug/kg	1000	790	968	79	97	59-125	20	20	
1,1-Dichloropropene	ug/kg	1000	799	946	80	95	64-125	17	20	
1,2,3-Trichlorobenzene	ug/kg	1000	776	965	78	97	55-126	22	20	R1
1,2,3-Trichloropropane	ug/kg	1000	736	872	74	87	62-125	17	20	
1,2,4-Trichlorobenzene	ug/kg	1000	804	961	80	96	62-125	18	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

LABORATORY CONTROL SAMPLE & LCSD: 2871003

2871004

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	793	931	79	93	59-125	16	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1890	2200	76	88	54-125	15	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	781	899	78	90	64-125	14	20	
1,2-Dichlorobenzene	ug/kg	1000	765	890	76	89	63-125	15	20	
1,2-Dichloroethane	ug/kg	1000	684	807	68	81	57-125	17	20	
1,2-Dichloropropane	ug/kg	1000	779	896	78	90	67-125	14	20	
1,3,5-Trimethylbenzene	ug/kg	1000	811	936	81	94	59-125	14	20	
1,3-Dichlorobenzene	ug/kg	1000	738	884	74	88	64-125	18	20	
1,3-Dichloropropane	ug/kg	1000	757	878	76	88	64-125	15	20	
1,4-Dichlorobenzene	ug/kg	1000	766	874	77	87	63-125	13	20	
2,2-Dichloropropane	ug/kg	1000	860	973	86	97	37-126	12	20	
2-Butanone (MEK)	ug/kg	5000	3740	4230	75	85	48-125	12	20	
2-Chlorotoluene	ug/kg	1000	777	890	78	89	62-125	13	20	
4-Chlorotoluene	ug/kg	1000	763	893	76	89	63-125	16	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3630	4290	73	86	52-135	17	20	
Acetone	ug/kg	5000	5390	6150	108	123	65-125	13	20	
Allyl chloride	ug/kg	1000	747	873	75	87	52-125	16	20	
Benzene	ug/kg	1000	765	859	76	86	61-125	12	20	
Bromobenzene	ug/kg	1000	794	916	79	92	64-125	14	20	
Bromochloromethane	ug/kg	1000	791	915	79	91	65-125	15	20	
Bromodichloromethane	ug/kg	1000	832	969	83	97	57-125	15	20	
Bromoform	ug/kg	1000	784	903	78	90	57-125	14	20	
Bromomethane	ug/kg	1000	777	845	78	85	60-125	8	20	
Carbon tetrachloride	ug/kg	1000	848	960	85	96	58-125	12	20	
Chlorobenzene	ug/kg	1000	782	883	78	88	66-125	12	20	
Chloroethane	ug/kg	1000	825	870	83	87	62-125	5	20	
Chloroform	ug/kg	1000	701	786	70	79	59-125	11	20	
Chloromethane	ug/kg	1000	733	791	73	79	50-125	8	20	
cis-1,2-Dichloroethene	ug/kg	1000	761	895	76	89	61-125	16	20	
cis-1,3-Dichloropropene	ug/kg	1000	794	937	79	94	61-125	17	20	
Dibromochloromethane	ug/kg	1000	790	890	79	89	60-125	12	20	
Dibromomethane	ug/kg	1000	808	948	81	95	69-125	16	20	
Dichlorodifluoromethane	ug/kg	1000	672	702	67	70	38-125	4	20	
Dichlorofluoromethane	ug/kg	1000	765	803	76	80	67-125	5	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1390	1250	139	125	60-125	11	20 L3	
Ethylbenzene	ug/kg	1000	775	906	78	91	62-125	16	20	
Hexachloro-1,3-butadiene	ug/kg	1000	810	968	81	97	56-125	18	20	
Isopropylbenzene (Cumene)	ug/kg	1000	836	962	84	96	65-125	14	20	
Methyl-tert-butyl ether	ug/kg	1000	731	855	73	86	59-125	16	20	
Methylene Chloride	ug/kg	1000	774	888	77	89	64-125	14	20	
n-Butylbenzene	ug/kg	1000	802	976	80	98	59-125	20	20	
n-Propylbenzene	ug/kg	1000	808	931	81	93	61-125	14	20	
Naphthalene	ug/kg	1000	818	982	82	98	53-125	18	20	
p-Isopropyltoluene	ug/kg	1000	794	949	79	95	63-125	18	20	
sec-Butylbenzene	ug/kg	1000	819	960	82	96	62-125	16	20	
Styrene	ug/kg	1000	816	950	82	95	66-125	15	20	
tert-Butylbenzene	ug/kg	1000	806	939	81	94	64-125	15	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Parameter	Units	2871003		2871004			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Tetrachloroethene	ug/kg	1000	810	941	81	94	67-125	15	20	
Tetrahydrofuran	ug/kg	10000	11200	12700	112	127	62-125	12	20	L3
Toluene	ug/kg	1000	798	905	80	91	61-125	13	20	
trans-1,2-Dichloroethene	ug/kg	1000	807	948	81	95	64-125	16	20	
trans-1,3-Dichloropropene	ug/kg	1000	809	946	81	95	56-125	16	20	
Trichloroethene	ug/kg	1000	767	896	77	90	67-125	15	20	N2
Trichlorofluoromethane	ug/kg	1000	782	818	78	82	65-125	5	20	
Vinyl chloride	ug/kg	1000	805	843	81	84	57-125	5	20	
Xylene (Total)	ug/kg	3000	2420	2790	81	93	62-125	14	20	
1,2-Dichloroethane-d4 (S)	%				91	91	75-125			
4-Bromofluorobenzene (S)	%				101	100	75-125			
Toluene-d8 (S)	%				99	98	75-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528399

Analysis Method: EPA 8081B

QC Batch Method: EPA 3550

Analysis Description: 8081S GCS Pesticides

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867751

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/02/18 19:38	
4,4'-DDE	ug/kg	ND	3.3	04/02/18 19:38	
4,4'-DDT	ug/kg	ND	3.3	04/02/18 19:38	
Aldrin	ug/kg	ND	1.7	04/02/18 19:38	
alpha-BHC	ug/kg	ND	1.7	04/02/18 19:38	
alpha-Chlordane	ug/kg	ND	1.7	04/02/18 19:38	
beta-BHC	ug/kg	ND	1.7	04/02/18 19:38	
Chlordane (Technical)	ug/kg	ND	16.7	04/02/18 19:38	
delta-BHC	ug/kg	ND	1.7	04/02/18 19:38	
Dieldrin	ug/kg	ND	3.3	04/02/18 19:38	
Endosulfan I	ug/kg	ND	1.7	04/02/18 19:38	
Endosulfan II	ug/kg	ND	3.3	04/02/18 19:38	
Endosulfan sulfate	ug/kg	ND	3.3	04/02/18 19:38	
Endrin	ug/kg	ND	3.3	04/02/18 19:38	
Endrin aldehyde	ug/kg	ND	3.3	04/02/18 19:38	
Endrin ketone	ug/kg	ND	3.3	04/02/18 19:38	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/02/18 19:38	
gamma-Chlordane	ug/kg	ND	1.7	04/02/18 19:38	
Heptachlor	ug/kg	ND	1.7	04/02/18 19:38	
Heptachlor epoxide	ug/kg	ND	1.7	04/02/18 19:38	
Methoxychlor	ug/kg	ND	16.7	04/02/18 19:38	
Toxaphene	ug/kg	ND	50.0	04/02/18 19:38	
Decachlorobiphenyl (S)	%	87	30-150	04/02/18 19:38	
Tetrachloro-m-xylene (S)	%	96	30-150	04/02/18 19:38	

LABORATORY CONTROL SAMPLE: 2867752

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	32.6	98	62-127	
4,4'-DDE	ug/kg	33.3	32.1	96	66-125	
4,4'-DDT	ug/kg	33.3	31.4	94	67-128	
Aldrin	ug/kg	16.7	14.7	88	66-125	
alpha-BHC	ug/kg	16.7	15.7	94	64-125	
alpha-Chlordane	ug/kg	16.7	15.3	92	68-125	
beta-BHC	ug/kg	16.7	15.4	92	69-125	
delta-BHC	ug/kg	16.7	15.1	91	42-133	
Dieldrin	ug/kg	33.3	33.5	100	69-126	
Endosulfan I	ug/kg	16.7	13.8	83	63-125	
Endosulfan II	ug/kg	33.3	32.3	97	69-125	
Endosulfan sulfate	ug/kg	33.3	29.5	89	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

LABORATORY CONTROL SAMPLE: 2867752

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	30.9	93	69-125	
Endrin aldehyde	ug/kg	33.3	30.6	92	65-125	
Endrin ketone	ug/kg	33.3	33.5	101	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.6	94	67-125	
gamma-Chlordane	ug/kg	16.7	14.2	85	63-125	
Heptachlor	ug/kg	16.7	15.8	95	69-125	
Heptachlor epoxide	ug/kg	16.7	15.4	93	68-125	
Methoxychlor	ug/kg	167	166	99	65-134	
Decachlorobiphenyl (S)	%			86	30-150	
Tetrachloro-m-xylene (S)	%			93	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867753 2867754

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424249001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	48.9	49.1	50.9	54.3	104	111	56-125	7	20	
4,4'-DDE	ug/kg	52.5	48.9	49.1	57.1	79.0	9	54	32-150	32	20	M6,R1
4,4'-DDT	ug/kg	ND	48.9	49.1	51.7	59.7	105	122	60-132	14	20	
Aldrin	ug/kg	ND	24.5	24.5	21.1J	22.8J	86	93	56-125		20	
alpha-BHC	ug/kg	ND	24.5	24.5	22.8J	23.3J	93	95	54-136		20	
alpha-Chlordane	ug/kg	ND	24.5	24.5	22.3J	28.2	91	115	54-133		20	
beta-BHC	ug/kg	35.0	24.5	24.5	33.4	37.2	-7	9	30-150	11	20	M6
delta-BHC	ug/kg	ND	24.5	24.5	27.0	29.6	110	121	45-145	9	20	
Dieldrin	ug/kg	ND	48.9	49.1	62.7	63.0	128	129	47-150	1	20	
Endosulfan I	ug/kg	ND	24.5	24.5	21J	25.3	86	103	35-145		20	
Endosulfan II	ug/kg	ND	48.9	49.1	50.7	48.4J	104	99	50-147		20	
Endosulfan sulfate	ug/kg	ND	48.9	49.1	65.5	51.1	134	104	54-132	25	20	M6,R1
Endrin	ug/kg	ND	48.9	49.1	48.3J	46.2J	99	94	62-125		20	
Endrin aldehyde	ug/kg	56.5	48.9	49.1	77.9	49.0	44	-15	33-150	46	20	M6,R1
Endrin ketone	ug/kg	50.8	48.9	49.1	61.4	85.8	22	71	56-144	33	20	M6,R1
gamma-BHC (Lindane)	ug/kg	ND	24.5	24.5	23.4J	23.5J	96	96	63-125		20	
gamma-Chlordane	ug/kg	ND	24.5	24.5	25.3	27.3	103	111	45-132	8	20	
Heptachlor	ug/kg	ND	24.5	24.5	23.7J	24.8	97	101	51-142		20	
Heptachlor epoxide	ug/kg	ND	24.5	24.5	22.2J	26.2	91	107	50-142		20	
Methoxychlor	ug/kg	ND	245	245	235J	252	96	103	58-139		20	
Decachlorobiphenyl (S)	%						0	0	30-150			S4
Tetrachloro-m-xylene (S)	%						0	0	30-150			3M,D4, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528407 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867808 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	03/26/18 15:29	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	03/26/18 15:29	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	03/26/18 15:29	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	03/26/18 15:29	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	03/26/18 15:29	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	03/26/18 15:29	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	03/26/18 15:29	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	03/26/18 15:29	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	03/26/18 15:29	
Decachlorobiphenyl (S)	%	93	30-134	03/26/18 15:29	
Tetrachloro-m-xylene (S)	%	101	48-125	03/26/18 15:29	

LABORATORY CONTROL SAMPLE: 2867809

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	597	90	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	576	86	62-125	
Decachlorobiphenyl (S)	%			94	30-134	
Tetrachloro-m-xylene (S)	%			100	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867810 2867811

Parameter	Units	10424249002		2867810		2867811		% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
PCB-1016 (Aroclor 1016)	ug/kg	ND	2330	2330	2210	2250	95	97	30-150	2	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	2330	2330	2150	2180	92	94	30-138	2	30	
Decachlorobiphenyl (S)	%						102	102	30-134			
Tetrachloro-m-xylene (S)	%						101	105	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528383

Analysis Method: EPA 8270D

QC Batch Method: EPA 3550

Analysis Description: 8270D Solid MSSV

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867687

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	03/31/18 14:07	
1,2-Dichlorobenzene	ug/kg	ND	330	03/31/18 14:07	
1,2-Diphenylhydrazine	ug/kg	ND	330	03/31/18 14:07	
1,3-Dichlorobenzene	ug/kg	ND	330	03/31/18 14:07	
1,4-Dichlorobenzene	ug/kg	ND	330	03/31/18 14:07	
1-Methylnaphthalene	ug/kg	ND	330	03/31/18 14:07	
2,4,5-Trichlorophenol	ug/kg	ND	330	03/31/18 14:07	
2,4,6-Trichlorophenol	ug/kg	ND	330	03/31/18 14:07	
2,4-Dichlorophenol	ug/kg	ND	330	03/31/18 14:07	
2,4-Dimethylphenol	ug/kg	ND	330	03/31/18 14:07	
2,4-Dinitrophenol	ug/kg	ND	330	03/31/18 14:07	
2,4-Dinitrotoluene	ug/kg	ND	330	03/31/18 14:07	
2,6-Dinitrotoluene	ug/kg	ND	330	03/31/18 14:07	
2-Chloronaphthalene	ug/kg	ND	330	03/31/18 14:07	
2-Chlorophenol	ug/kg	ND	330	03/31/18 14:07	
2-Methylnaphthalene	ug/kg	ND	330	03/31/18 14:07	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	03/31/18 14:07	
2-Nitroaniline	ug/kg	ND	330	03/31/18 14:07	
2-Nitrophenol	ug/kg	ND	330	03/31/18 14:07	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	03/31/18 14:07	
3,3'-Dichlorobenzidine	ug/kg	ND	330	03/31/18 14:07	
3-Nitroaniline	ug/kg	ND	330	03/31/18 14:07	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	03/31/18 14:07	
4-Bromophenylphenyl ether	ug/kg	ND	330	03/31/18 14:07	
4-Chloro-3-methylphenol	ug/kg	ND	330	03/31/18 14:07	
4-Chloroaniline	ug/kg	ND	330	03/31/18 14:07	
4-Chlorophenylphenyl ether	ug/kg	ND	330	03/31/18 14:07	
4-Nitroaniline	ug/kg	ND	330	03/31/18 14:07	
4-Nitrophenol	ug/kg	ND	330	03/31/18 14:07	
Acenaphthene	ug/kg	ND	330	03/31/18 14:07	
Acenaphthylene	ug/kg	ND	330	03/31/18 14:07	
Anthracene	ug/kg	ND	330	03/31/18 14:07	
Benzo(a)anthracene	ug/kg	ND	330	03/31/18 14:07	
Benzo(a)pyrene	ug/kg	ND	330	03/31/18 14:07	
Benzo(b)fluoranthene	ug/kg	ND	330	03/31/18 14:07	
Benzo(g,h,i)perylene	ug/kg	ND	330	03/31/18 14:07	
Benzo(k)fluoranthene	ug/kg	ND	330	03/31/18 14:07	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	03/31/18 14:07	
bis(2-Chloroethyl) ether	ug/kg	ND	330	03/31/18 14:07	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	03/31/18 14:07	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	03/31/18 14:07	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

METHOD BLANK: 2867687

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	03/31/18 14:07	
Carbazole	ug/kg	ND	330	03/31/18 14:07	
Chrysene	ug/kg	ND	330	03/31/18 14:07	
Di-n-butylphthalate	ug/kg	ND	330	03/31/18 14:07	
Di-n-octylphthalate	ug/kg	ND	330	03/31/18 14:07	
Dibenz(a,h)anthracene	ug/kg	ND	330	03/31/18 14:07	
Dibenzofuran	ug/kg	ND	330	03/31/18 14:07	
Diethylphthalate	ug/kg	ND	330	03/31/18 14:07	
Dimethylphthalate	ug/kg	ND	330	03/31/18 14:07	
Fluoranthene	ug/kg	ND	330	03/31/18 14:07	
Fluorene	ug/kg	ND	330	03/31/18 14:07	
Hexachloro-1,3-butadiene	ug/kg	ND	330	03/31/18 14:07	
Hexachlorobenzene	ug/kg	ND	330	03/31/18 14:07	
Hexachloroethane	ug/kg	ND	330	03/31/18 14:07	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	03/31/18 14:07	
Isophorone	ug/kg	ND	330	03/31/18 14:07	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	03/31/18 14:07	
N-Nitrosodimethylamine	ug/kg	ND	330	03/31/18 14:07	
N-Nitrosodiphenylamine	ug/kg	ND	330	03/31/18 14:07	
Naphthalene	ug/kg	ND	330	03/31/18 14:07	
Nitrobenzene	ug/kg	ND	330	03/31/18 14:07	
Pentachlorophenol	ug/kg	ND	670	03/31/18 14:07	
Phenanthrene	ug/kg	ND	330	03/31/18 14:07	
Phenol	ug/kg	ND	330	03/31/18 14:07	
Pyrene	ug/kg	ND	330	03/31/18 14:07	
2,4,6-Tribromophenol (S)	%	88	60-125	03/31/18 14:07	
2-Fluorobiphenyl (S)	%	86	30-132	03/31/18 14:07	
2-Fluorophenol (S)	%	89	40-125	03/31/18 14:07	
Nitrobenzene-d5 (S)	%	86	43-125	03/31/18 14:07	
p-Terphenyl-d14 (S)	%	96	62-125	03/31/18 14:07	
Phenol-d6 (S)	%	90	48-125	03/31/18 14:07	

LABORATORY CONTROL SAMPLE: 2867688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1120	67	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1120	67	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1530	92	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1130	68	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1130	68	39-125	
1-Methylnaphthalene	ug/kg	1670	1280	77	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1380	83	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1360	81	61-125	
2,4-Dichlorophenol	ug/kg	1670	1310	79	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

LABORATORY CONTROL SAMPLE: 2867688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1390	84	51-125	
2,4-Dinitrophenol	ug/kg	1670	1370	82	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1500	90	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1470	88	63-125	
2-Chloronaphthalene	ug/kg	1670	1340	80	61-125	
2-Chlorophenol	ug/kg	1670	1180	71	46-125	
2-Methylnaphthalene	ug/kg	1670	1270	76	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1290	78	50-125	
2-Nitroaniline	ug/kg	1670	1580	95	61-125	
2-Nitrophenol	ug/kg	1670	1230	74	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1340	80	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1200	72	47-125	5M
3-Nitroaniline	ug/kg	1670	1370	82	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1490J	90	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1470	88	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1480	89	64-125	
4-Chloroaniline	ug/kg	1670	971	58	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1400	84	64-125	
4-Nitroaniline	ug/kg	1670	1430	86	59-125	
4-Nitrophenol	ug/kg	1670	1600	96	54-125	
Acenaphthene	ug/kg	1670	1380	83	62-125	
Acenaphthylene	ug/kg	1670	1390	83	61-125	
Anthracene	ug/kg	1670	1480	89	66-125	
Benzo(a)anthracene	ug/kg	1670	1440	86	69-125	
Benzo(a)pyrene	ug/kg	1670	1480	89	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1480	89	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1470	88	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1480	89	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1300	78	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1270	76	41-125	5M
bis(2-Chloroisopropyl) ether	ug/kg	1670	1350	81	37-125	5M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1550	93	69-131	
Butylbenzylphthalate	ug/kg	1670	1550	93	69-129	
Carbazole	ug/kg	1670	1490	89	66-125	
Chrysene	ug/kg	1670	1470	88	68-125	
Di-n-butylphthalate	ug/kg	1670	1580	95	69-125	
Di-n-octylphthalate	ug/kg	1670	1570	94	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1510	91	64-125	
Dibenzofuran	ug/kg	1670	1390	84	65-125	
Diethylphthalate	ug/kg	1670	1500	90	67-125	
Dimethylphthalate	ug/kg	1670	1450	87	67-125	
Fluoranthene	ug/kg	1670	1480	89	66-125	
Fluorene	ug/kg	1670	1390	84	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1160	70	40-125	
Hexachlorobenzene	ug/kg	1670	1510	91	62-125	
Hexachloroethane	ug/kg	1670	1140	68	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1490	89	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

LABORATORY CONTROL SAMPLE: 2867688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1370	82	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1400	84	50-125	5M
N-Nitrosodimethylamine	ug/kg	1670	1220	73	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1490	89	65-125	
Naphthalene	ug/kg	1670	1210	72	48-125	
Nitrobenzene	ug/kg	1670	1320	79	48-125	
Pentachlorophenol	ug/kg	1670	1360	81	41-125	
Phenanthrene	ug/kg	1670	1470	88	66-125	
Phenol	ug/kg	1670	1300	78	46-125	
Pyrene	ug/kg	1670	1440	87	69-125	
2,4,6-Tribromophenol (S)	%			98	60-125	
2-Fluorobiphenyl (S)	%			86	30-132	
2-Fluorophenol (S)	%			78	40-125	
Nitrobenzene-d5 (S)	%			81	43-125	
p-Terphenyl-d14 (S)	%			95	62-125	
Phenol-d6 (S)	%			84	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867689 2867690

Parameter	Units	10424249001		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result							
1,2,4-Trichlorobenzene	ug/kg	ND	2450	2460	1480J	1510J	60	62	30-127		30		
1,2-Dichlorobenzene	ug/kg	ND	2450	2460	1410J	1460J	57	60	30-125		30		
1,2-Diphenylhydrazine	ug/kg	ND	2450	2460	1910J	1800J	78	73	30-150		30		
1,3-Dichlorobenzene	ug/kg	ND	2450	2460	1290J	1200J	53	49	30-125		30		
1,4-Dichlorobenzene	ug/kg	ND	2450	2460	1670J	1690J	68	69	30-125		30		
1-Methylnaphthalene	ug/kg	ND	2450	2460	2130J	2300J	87	94	42-125		30		
2,4,5-Trichlorophenol	ug/kg	ND	2450	2460	1660J	1550J	68	63	30-150		30		
2,4,6-Trichlorophenol	ug/kg	ND	2450	2460	1740J	1710J	71	70	30-150		30		
2,4-Dichlorophenol	ug/kg	ND	2450	2460	1670J	1660J	68	67	30-135		30		
2,4-Dimethylphenol	ug/kg	ND	2450	2460	1910J	1820J	78	74	30-148		30		
2,4-Dinitrophenol	ug/kg	ND	2450	2460	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	2450	2460	1650J	1690J	67	69	30-150		30		
2,6-Dinitrotoluene	ug/kg	ND	2450	2460	1740J	1680J	71	68	30-150		30		
2-Chloronaphthalene	ug/kg	ND	2450	2460	1750J	1730J	72	70	30-138		30		
2-Chlorophenol	ug/kg	ND	2450	2460	1560J	1440J	64	59	30-130		30		
2-Methylnaphthalene	ug/kg	ND	2450	2460	2270J	2500	93	102	46-125		30		
2-Methylphenol(o-Cresol)	ug/kg	ND	2450	2460	1730J	1640J	71	67	30-133		30		
2-Nitroaniline	ug/kg	ND	2450	2460	2040J	1930J	83	79	30-150		30		
2-Nitrophenol	ug/kg	ND	2450	2460	1300J	1510J	53	61	30-134		30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	2450	2460	1870J	1700J	76	69	30-138		30		
3,3'-Dichlorobenzidine	ug/kg	ND	2450	2460	1820J	1780J	74	72	30-149		30	5M	
3-Nitroaniline	ug/kg	ND	2450	2460	1410J	1040J	57	43	30-150		30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	2450	2460	ND	ND	0	0	30-133		30	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2867689		2867690										
Parameter	Units	MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		10424249001	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
4-Bromophenylphenyl ether	ug/kg	ND	2450	2460	1950J	1770J	80	72	44-125				30	
4-Chloro-3-methylphenol	ug/kg	ND	2450	2460	1840J	1750J	75	71	30-150				30	
4-Chloroaniline	ug/kg	ND	2450	2460	1310J	990J	54	40	30-125				30	
4-Chlorophenylphenyl ether	ug/kg	ND	2450	2460	1710J	1620J	70	66	44-125				30	
4-Nitroaniline	ug/kg	ND	2450	2460	1830J	1600J	75	65	30-150				30	
4-Nitrophenol	ug/kg	ND	2450	2460	1610J	1380J	66	56	30-150				30	
Acenaphthene	ug/kg	ND	2450	2460	2000J	2020J	62	63	40-125				30	
Acenaphthylene	ug/kg	ND	2450	2460	1740J	1680J	71	69	30-150				30	
Anthracene	ug/kg	ND	2450	2460	1970J	1830J	80	75	30-150				30	
Benzo(a)anthracene	ug/kg	ND	2450	2460	2060J	2130J	84	87	30-150				30	
Benzo(a)pyrene	ug/kg	ND	2450	2460	1880J	1960J	77	80	30-150				30	
Benzo(b)fluoranthene	ug/kg	ND	2450	2460	1970J	1980J	80	81	30-150				30	
Benzo(g,h,i)perylene	ug/kg	ND	2450	2460	1930J	1830J	79	75	30-150				30	
Benzo(k)fluoranthene	ug/kg	ND	2450	2460	1840J	1960J	75	80	30-150				30	
bis(2-Chloroethoxy)methane	ug/kg	ND	2450	2460	1650J	1760J	67	72	30-134				30	
bis(2-Chloroethyl) ether	ug/kg	ND	2450	2460	1360J	1480J	55	60	30-125				30	5M
bis(2-Chloroisopropyl) ether	ug/kg	ND	2450	2460	1590J	1430J	65	58	30-125				30	5M
bis(2-Ethylhexyl)phthalate	ug/kg	483000	2450	2460	346000	501000	-5600	742	30-150		37		30	E,M1, R1
Butylbenzylphthalate	ug/kg	2630	2450	2460	3400	3310	31	28	30-150		3		30	M1
Carbazole	ug/kg	ND	2450	2460	2000J	1820J	82	74	41-125				30	
Chrysene	ug/kg	ND	2450	2460	2120J	2150J	86	88	30-150				30	
Di-n-butylphthalate	ug/kg	2450	2450	2460	2980	3070	22	25	30-150		3		30	M1
Di-n-octylphthalate	ug/kg	4800	2450	2460	2970	5690	-75	36	30-150		63		30	M1,R1
Dibenz(a,h)anthracene	ug/kg	ND	2450	2460	1790J	1640J	73	67	30-150				30	
Dibenzofuran	ug/kg	ND	2450	2460	2820	2800	66	65	45-125		1		30	
Diethylphthalate	ug/kg	ND	2450	2460	2090J	2070J	85	84	30-150				30	
Dimethylphthalate	ug/kg	ND	2450	2460	1780J	1670J	73	68	30-150				30	
Fluoranthene	ug/kg	ND	2450	2460	2720	2420J	111	99	30-150				30	
Fluorene	ug/kg	ND	2450	2460	2610	2650	107	108	30-150		1		30	
Hexachloro-1,3-butadiene	ug/kg	ND	2450	2460	1490J	1510J	61	61	30-128				30	
Hexachlorobenzene	ug/kg	ND	2450	2460	1710J	1560J	70	64	30-150				30	
Hexachloroethane	ug/kg	ND	2450	2460	1950J	2110J	79	86	30-125				30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	2450	2460	1820J	1730J	74	70	30-150				30	
Isophorone	ug/kg	ND	2450	2460	1720J	1710J	70	70	30-140				30	
N-Nitroso-di-n-propylamine	ug/kg	ND	2450	2460	1680J	1580J	69	64	30-147				30	5M
N-Nitrosodimethylamine	ug/kg	ND	2450	2460	984J	899J	40	37	30-125				30	
N-Nitrosodiphenylamine	ug/kg	ND	2450	2460	2160J	2210J	88	90	30-150				30	
Naphthalene	ug/kg	2940	2450	2460	2770	3180	-7	10	44-125		14		30	M1
Nitrobenzene	ug/kg	ND	2450	2460	1550J	1650J	63	67	30-136				30	
Pentachlorophenol	ug/kg	ND	2450	2460	1070J	1160J	44	47	30-150				30	
Phenanthrene	ug/kg	ND	2450	2460	3580	3800	57	66	30-150		6		30	
Phenol	ug/kg	ND	2450	2460	1720J	1590J	70	65	30-129				30	
Pyrene	ug/kg	ND	2450	2460	2400J	2220J	98	90	30-150				30	
2,4,6-Tribromophenol (S)	%						72	66	60-125					
2-Fluorobiphenyl (S)	%						75	73	30-132					

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2867689		2867690		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
2-Fluorophenol (S)	%.					63	61	40-125			
Nitrobenzene-d5 (S)	%.					65	65	43-125			D4
p-Terphenyl-d14 (S)	%.					74	71	62-125			
Phenol-d6 (S)	%.					69	67	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528330

Analysis Method: EPA 8270D by SIM

QC Batch Method: EPA 3550

Analysis Description: 8270D Solid PAH by SIM MSSV

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2867448

Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	03/22/18 13:08	
Acenaphthylene	ug/kg	ND	10.0	03/22/18 13:08	
Anthracene	ug/kg	ND	10.0	03/22/18 13:08	
Benzo(a)anthracene	ug/kg	ND	10.0	03/22/18 13:08	
Benzo(a)pyrene	ug/kg	ND	10.0	03/22/18 13:08	
Benzo(b)fluoranthene	ug/kg	ND	10.0	03/22/18 13:08	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	03/22/18 13:08	
Benzo(k)fluoranthene	ug/kg	ND	10.0	03/22/18 13:08	
Chrysene	ug/kg	ND	10.0	03/22/18 13:08	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	03/22/18 13:08	
Fluoranthene	ug/kg	ND	10.0	03/22/18 13:08	
Fluorene	ug/kg	ND	10.0	03/22/18 13:08	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	03/22/18 13:08	
Naphthalene	ug/kg	ND	10.0	03/22/18 13:08	
Phenanthrene	ug/kg	ND	10.0	03/22/18 13:08	
Pyrene	ug/kg	ND	10.0	03/22/18 13:08	
2-Fluorobiphenyl (S)	%	46	42-125	03/22/18 13:08	
p-Terphenyl-d14 (S)	%	81	57-125	03/22/18 13:08	

LABORATORY CONTROL SAMPLE: 2867449

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	20.5	61	52-125	
Acenaphthylene	ug/kg	33.3	21.6	65	50-125	
Anthracene	ug/kg	33.3	31.0	93	65-125	
Benzo(a)anthracene	ug/kg	33.3	32.2	97	60-125	
Benzo(a)pyrene	ug/kg	33.3	33.0	99	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	32.6	98	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	31.8	96	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	32.0	96	67-125	
Chrysene	ug/kg	33.3	30.5	92	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	32.4	97	63-125	
Fluoranthene	ug/kg	33.3	32.1	96	75-125	
Fluorene	ug/kg	33.3	23.9	72	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	33.8	101	63-125	
Naphthalene	ug/kg	33.3	19.4	58	49-125	
Phenanthrene	ug/kg	33.3	27.4	82	65-125	
Pyrene	ug/kg	33.3	29.1	87	64-125	
2-Fluorobiphenyl (S)	%			60	42-125	
p-Terphenyl-d14 (S)	%			84	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Parameter	Units	2867450		2867451		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Acenaphthene	ug/kg	74.5J	84.5	84.5	130	122J	65	57	30-125		30		
Acenaphthylene	ug/kg	26.8J	84.5	84.5	91.9J	84J	77	68	30-133		30		
Anthracene	ug/kg	170	84.5	84.5	246	251	89	95	30-150	2	30		
Benzo(a)anthracene	ug/kg	361	84.5	84.5	453	418	109	68	30-150	8	30		
Benzo(a)pyrene	ug/kg	412	84.5	84.5	471	381	69	-37	30-150	21	30	M1	
Benzo(b)fluoranthene	ug/kg	534	84.5	84.5	544	455	11	-94	30-150	18	30	M1	
Benzo(g,h,i)perylene	ug/kg	242	84.5	84.5	293	226	61	-19	30-150	26	30	M1	
Benzo(k)fluoranthene	ug/kg	169	84.5	84.5	293	234	147	76	30-150	23	30		
Chrysene	ug/kg	416	84.5	84.5	535	396	141	-24	30-150	30	30	M1	
Dibenz(a,h)anthracene	ug/kg	70.2J	84.5	84.5	140	96.7J	83	31	30-131		30		
Fluoranthene	ug/kg	773	84.5	84.5	885	820	131	55	30-150	8	30		
Fluorene	ug/kg	66.3J	84.5	84.5	134	119J	80	62	30-147		30		
Indeno(1,2,3-cd)pyrene	ug/kg	224	84.5	84.5	279	195	66	-35	30-150	36	30	M1,R1	
Naphthalene	ug/kg	15.5J	84.5	84.5	46.7J	50.9J	37	42	30-131		30		
Phenanthrene	ug/kg	512	84.5	84.5	566	540	64	33	30-150	5	30		
Pyrene	ug/kg	656	84.5	84.5	755	709	118	63	30-150	6	30		
2-Fluorobiphenyl (S)	%.							76	42-125				D3
p-Terphenyl-d14 (S)	%.							94	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528725 Analysis Method: EPA 8270D
QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2869530 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	03/29/18 15:27	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	03/29/18 15:27	
2,4-D	mg/kg	ND	0.033	03/29/18 15:27	
2,4-DB	mg/kg	ND	0.033	03/29/18 15:27	
Bentazon	mg/kg	ND	0.033	03/29/18 15:27	
Dicamba	mg/kg	ND	0.033	03/29/18 15:27	
Dinoseb	mg/kg	ND	0.033	03/29/18 15:27	
MCPA	mg/kg	ND	0.033	03/29/18 15:27	
Pentachlorophenol	mg/kg	ND	0.033	03/29/18 15:27	
Picloram	mg/kg	ND	0.033	03/29/18 15:27	
Triclopyr	mg/kg	ND	0.033	03/29/18 15:27	
2,4-DCAA (S)	%	81	46-125	03/29/18 15:27	

LABORATORY CONTROL SAMPLE: 2869531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.27	81	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	77	61-125	
2,4-D	mg/kg	.33	0.28	83	63-125	
2,4-DB	mg/kg	.33	0.26	79	59-125	
Bentazon	mg/kg	.33	0.24	73	58-125	
Dicamba	mg/kg	.33	0.26	78	52-125	
Dinoseb	mg/kg	.33	0.23	68	35-126	
MCPA	mg/kg	.33	0.26	78	57-125	
Pentachlorophenol	mg/kg	.33	0.27	81	48-125	
Picloram	mg/kg	.33	0.22	65	47-125	
Triclopyr	mg/kg	.33	0.27	80	68-125	
2,4-DCAA (S)	%			87	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869532 2869533

Parameter	Units	10424249001		2869533		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
2,4,5-T	mg/kg	ND	.97	.97	0.49	.42J	50	43	30-145	20	
2,4,5-TP (Silvex)	mg/kg	ND	.97	.97	0.69	0.57	70	58	30-130	19	20
2,4-D	mg/kg	ND	.97	.97	1.7	.3J	176	31	30-150	20	M1
2,4-DB	mg/kg	ND	.97	.97	0.69	0.60	71	61	45-126	15	20
Bentazon	mg/kg	ND	.97	.97	0.87	0.66	89	67	30-133	28	20 R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869532		2869533		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dicamba	mg/kg	ND	.97	.97	.42J	.36J	43	37	30-140		20		
Dinoseb	mg/kg	ND	.97	.97	0.91	0.82	93	84	30-136	10	20		
MCPA	mg/kg	ND	.97	.97	0.55	0.55	56	57	30-136	0	20		
Pentachlorophenol	mg/kg	ND	.97	.97	0.63	0.70	64	71	44-125	11	20		
Picloram	mg/kg	ND	.97	.97	ND	ND	0	0	30-125		20	M1	
Triclopyr	mg/kg	ND	.97	.97	0.59	0.52	60	54	30-149	12	20		
2,4-DCAA (S)	%						78	68	46-125				D3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 528474 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2868174 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/22/18 09:57	
n-Triacontane (S)	%.	89	50-150	03/22/18 09:57	

LABORATORY CONTROL SAMPLE & LCSD: 2868175

2868176

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	62.9	66.2	79	83	70-120	5	20	
n-Triacontane (S)	%.				89	92	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424249

QC Batch: 434844 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 2008420 Matrix: Solid
Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/03/18 11:09	

LABORATORY CONTROL SAMPLE: 2008421

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1090	929	85	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008432 2008433

Parameter	Units	50193104001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	2190	2230	ND	ND	0	0	75-125		20	2M, M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008434 2008435

Parameter	Units	50193104001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	79.1	80.9	4.7J	6.3J	2	4	75-125		20	M3

SAMPLE DUPLICATE: 2008431

Parameter	Units	469837006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424249

QC Batch: 284581 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10424249001

METHOD BLANK: 1665480 Matrix: Solid
Associated Lab Samples: 10424249001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	03/29/18 12:23	

LABORATORY CONTROL SAMPLE: 1665481

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	2.8	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665482 1665483

Parameter	Units	40166365001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max		Qual	
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result				RPD	RPD		
Cyanide	mg/kg	0.16J	1.89	1.89	1.89	1.9	1.9	93	91	80-120	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665484 1665485

Parameter	Units	10424249001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max		Qual	
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result				RPD	RPD		
Cyanide	mg/kg	2.2	4.72	4.72	4.72	7.2	4.9	105	57	80-120	37	20	M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 284583	Analysis Method: EPA 9012
QC Batch Method: EPA 9012A	Analysis Description: 9012 Cyanide
Associated Lab Samples: 10424249002	

METHOD BLANK: 1665486 Matrix: Solid
Associated Lab Samples: 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	03/29/18 12:56	

LABORATORY CONTROL SAMPLE: 1665487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665488 1665489

Parameter	Units	10424609003 Result	MS		MSD		% Rec		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Cyanide	mg/kg	ND	3.62	3.62	2.8	3.2	66	77	80-120	13	20	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665490 1665491

Parameter	Units	10424937006 Result	MS		MSD		% Rec		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Cyanide	mg/kg	0.56	4.11	4.26	4.2	4.0	89	81	80-120	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

QC Batch: 139654 Analysis Method: EPA 9056A
 QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
 Associated Lab Samples: 10424249001, 10424249002

METHOD BLANK: 553043 Matrix: Solid

Associated Lab Samples: 10424249001, 10424249002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.98	03/31/18 00:49	

LABORATORY CONTROL SAMPLE: 553042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	48.9	50.2	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553044 553045

Parameter	Units	10424443004 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Fluoride	mg/kg	2.9	50.3	28.2	28.6	50	51	80-120	1	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553046 553047

Parameter	Units	10424937003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Fluoride	mg/kg	3.5	49.3	14.1	15.9	21	25	80-120	12	20	M1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 529212

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.

2M Redox (25 mv) and pH (7.84) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.

3M Sample was dark brown in color and grainy. Sample was centrifuged and decanted.

4M Sample was dark yellow in color.

5M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424249

ANALYTE QUALIFIERS

- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424249

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424249001	FD-SB-A5(15-17)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424249002	FD-SB-B5(11.5-23)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424249001	FD-SB-A5(15-17)	EPA 3550	528399	EPA 8081B	530200
10424249002	FD-SB-B5(11.5-23)	EPA 3550	528399	EPA 8081B	530200
10424249001	FD-SB-A5(15-17)	EPA 3550	528407	EPA 8082A	529072
10424249002	FD-SB-B5(11.5-23)	EPA 3550	528407	EPA 8082A	529072
10424249001	FD-SB-A5(15-17)	WI MOD DRO	528474	WI MOD DRO	528523
10424249002	FD-SB-B5(11.5-23)	WI MOD DRO	528474	WI MOD DRO	528523
10424249001	FD-SB-A5(15-17)	EPA 5030 Medium Soil	529097	WI MOD GRO	529312
10424249002	FD-SB-B5(11.5-23)	EPA 5030 Medium Soil	529097	WI MOD GRO	529312
10424249001	FD-SB-A5(15-17)	EPA 3050	528272	EPA 6010C	528314
10424249002	FD-SB-B5(11.5-23)	EPA 3050	528272	EPA 6010C	528314
10424249001	FD-SB-A5(15-17)	EPA 3050B	434613	EPA 6020	434971
10424249002	FD-SB-B5(11.5-23)	EPA 3050B	434613	EPA 6020	434971
10424249001	FD-SB-A5(15-17)	EPA 3050	528270	EPA 6020A	528357
10424249002	FD-SB-B5(11.5-23)	EPA 3050	528270	EPA 6020A	528357
10424249001	FD-SB-A5(15-17)	EPA 7471	528273	EPA 7471	528417
10424249002	FD-SB-B5(11.5-23)	EPA 7471	528273	EPA 7471	528417
10424249001	FD-SB-A5(15-17)	ASTM D2974	528315		
10424249002	FD-SB-B5(11.5-23)	ASTM D2974	528315		
10424249001	FD-SB-A5(15-17)	EPA 3550	528383	EPA 8270D	529241
10424249002	FD-SB-B5(11.5-23)	EPA 3550	528383	EPA 8270D	529241
10424249001	FD-SB-A5(15-17)	EPA 3550	528330	EPA 8270D by SIM	528600
10424249002	FD-SB-B5(11.5-23)	EPA 3550	528330	EPA 8270D by SIM	528600
10424249001	FD-SB-A5(15-17)	EPA 3546	528725	EPA 8270D	529735
10424249002	FD-SB-B5(11.5-23)	EPA 3546	528725	EPA 8270D	529735
10424249001	FD-SB-A5(15-17)	EPA 5035/5030B	528973	EPA 8260B	529212
10424249002	FD-SB-B5(11.5-23)	EPA 5035/5030B	528973	EPA 8260B	529212
10424249001	FD-SB-A5(15-17)	EPA 3060A	434844	EPA 7196A	435162
10424249002	FD-SB-B5(11.5-23)	EPA 3060A	434844	EPA 7196A	435162
10424249001	FD-SB-A5(15-17)	Trivalent Chromium Calculation	435321		
10424249002	FD-SB-B5(11.5-23)	Trivalent Chromium Calculation	435321		
10424249001	FD-SB-A5(15-17)	EPA 9012A	284581	EPA 9012	284660
10424249002	FD-SB-B5(11.5-23)	EPA 9012A	284583	EPA 9012	284661
10424249001	FD-SB-A5(15-17)	EPA 300.0	139654	EPA 9056A	139672
10424249002	FD-SB-B5(11.5-23)	EPA 300.0	139654	EPA 9056A	139672

REPORT OF LABORATORY ANALYSIS

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Chain-of-Custody Form

Work Order Number:

COC Type:

Page: 1 of

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MPCA Freeway LF Soils Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA Freeway LF Soils Project Task Code:

Address:

Project Manager:

EPIC Profile # 38716

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 S-R=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wt-G=Groundwater
 Wt-S=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

PRESERV.

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	See attachment for soils/water	Dioxins	Lab Sample No.	#
FD-SB-A5 (15-17) WM		3/20/18	1300	15'	17'	C	SD	WM			11	X	X		001	1
FD-SB-A4 (15-23) S		3/20/18	1510	21.5'	23'	C	SD	S			10	X			002	2
																3
																4
																5
																6
																7
																8
																9
																10

WO#: 10424249



Sampled By: Chris Pelosi

Sampler's Signature: Chris Pelosi

Phone #: 612-597-7254

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <u>Chris Pelosi Pace</u>	<u>3/20/18 1655</u>	<u>MPCA Pace</u>	<u>3/20/18 1655</u>

1655
T=8.1
②

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluorine, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA-8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt

Client Name: MPPA Project #: _____

WO# : 10424249
 PM: BM2 Due Date: 04/03/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: _____ Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 8.1 Cooler Temp Corrected (°C): 8.3 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 40.2 Date and Initials of Person Examining Contents: 3/20/18 DP

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: BL

Date: 3/21/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

Handwritten initials

40166406
Pace Analytical
 www.pacelabs.com
 Page 56 of 64

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424249 Workorder Name: 18-00383 MPCA Freeway LF Soils Owner Received Date: 3/20/2018 Results Requested By: 4/3/2018

Report To		Subcontract To				Requested Analysis									
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436													
						Cyanide by EPA 9012									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					LAB USE ONLY				
						Unpreserved									
1	FD-SB-A5(15-17) <i>001</i>	PS	3/20/2018 13:00	10424249001	Solid	1						X			
2	FD-SB-B5(11.5-23) <i>002</i>	PS	3/20/2018 15:10	10424249002	Solid	1						X			
3															
4															
5															
Transfers												Comments			
Released By	Date/Time	Received By	Date/Time												
<i>myself Pace</i>	<i>3/23/18 1730</i>	<i>[Signature]</i>	<i>3/21/18 0805</i>												
<i>W. TCO</i>		<i>[Signature]</i>	<i>3/21/18 0805</i>												
Cooler Temperature on Receipt <i>2</i> °C		Custody Seal <i>Y</i> or N		Received on Ice <i>Y</i> or N		Samples Intact <i>Y</i> or N									

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name: Sample Condition Upon Receipt (SCUR)
Document No.: F-GB-C-031-rev.06

Document Revised: 31Jan2018
Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN

Project #: _____

WO#: **40166406**

Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____



Tracking #: 1674108-1

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 75 Type of Ice: Wet Blue Dry None Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 2 / Corr: 2

Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Person examining contents:
Date: 3/24/18
Initials: SSh

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4. <u>DRWO</u> <u>SSh 3/24/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. <u>001+002</u>
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>No client collect done</u> <u>SSh 3/24/18</u>
-Includes date/time/ID/Analysis Matrix: <u>3</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments
Person Contacted: _____ Date/Time: _____
Comments/ Resolution: 002 client ID FD-SB-A4 (21.5-235) Kf 3/24/18

Project Manager Review: Cue

Date: 3/26/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424249 Workorder Name: 18-00383 MPCA Freeway LF Soils Owner Received Date: 3/20/2018 Results Requested By: 4/3/2018

Report To		Subcontract To					Requested Analysis																																			
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					<table border="1"> <tr> <td colspan="12">Preserved Containers</td> </tr> <tr> <td>Chromium III</td> <td>Chromium VI</td> <td>Total Cr by 6020</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>												Preserved Containers												Chromium III	Chromium VI	Total Cr by 6020									
Preserved Containers																																										
Chromium III	Chromium VI	Total Cr by 6020																																								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																																				
1	FD-SB-A5(15-17)	PS	3/20/2018 13:00	10424249001	Solid	1						X	X	X							SOA3173																					
2	FD-SB-B5(11.5-23)	PS	3/20/2018 15:10	10424249002	Solid	1						X	X	X							LAB USE ONLY 001 002																					
3																																										
4																																										
5																																										

Transfers						Comments											
Released By	Date/Time	Received By	Date/Time														
<i>[Signature]</i>	3/27/18	<i>[Signature]</i>	3/28/18 0910														
FED EX		FED EX															

Cooler Temperature on Receipt 1.0 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193173

Date/Time and Initials of

person examining contents: 3/28/18 1415 AY

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7405

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 0.8/1.0 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

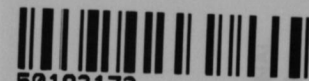
All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)? Analysis:		/	Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments:

Sample Container Count

WO#: 50193173



50193173

CLIENT: Pace MN

DOC PAGE 1 of 1

DOC ID# _____

Project # 50193173

SBS
DI

Bulk
Kit

Matrix Sl
(Soil/Water
Aqueous

pH <2 pH >9 pH >12

Sample Line Item	DC9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix Sl (Soil/Water Aqueous)	pH <2	pH >9	pH >12
1																			Soil			
2																			tr			
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass

Plastic / Misc.

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VG/SG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VG/AU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
BGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO#: 12106175
PM: HRZ Due Date: 04/03/18
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 6.9 Cooler Temp Corrected °C: 2.2 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 3-21-18 DC

Comments: M31218

Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Date: 3/22/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO# : 12106175



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MI

Workorder: 10424249

Workorder Name: 18-00383 MPCA Freeway LF Soils

Owner Received Date: 3/20/2018

Results Requested By: 4/3/2018

Report To		Subcontract To						Requested Analysis																	
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																							
							Preserved Containers					LAB USE ONLY													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																		Fluoride by 9056	
1	FD-SB-A5(15-17)	PS	3/20/2018 13:00	10424249001	Solid	1																			X
2	FD-SB-B5(11.5-23)	PS	3/20/2018 15:10	10424249002	Solid	1																			X
3																									
4																									
5																									

Transfers					Comments	
Released By	Date/Time	Received By	Date/Time			
<i>Myself Pace</i>	<i>3/27/18 1800</i>	<i>CB</i>	<i>3/27/18 1845</i>			
<i>CB</i>	<i>3/27/18 2230</i>	<i>[Signature]</i>	<i>3/28/18 1110</i>			

Cooler Temperature on Receipt 4.0 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace - Mpls.

Project #:

WO#: 12106175
 PM: HRZ Due Date: 03/28/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 3/27/18 CJS

Comments: al 3/28/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Heather ZTD Date: 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

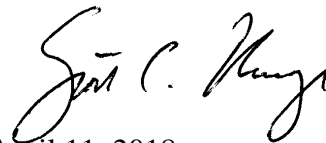
PaceProject#: 10424250
Sample Receipt Date: 03/20/2018
Client Project #: MPCA Freeway LF Soils
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 11, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 2, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of Pace Analytical Services, Inc. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 57%. Except for one low value, which was flagged "R" on the results table, the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

Laboratory and matrix spike samples were also prepared with the sample batch using clean reference matrix or sample matrix that had been fortified with native standard materials. The results show that the spiked native TCDD was recovered at 70-111% with a relative percent difference (RPD) of 25.3%. The RPD value obtained for the matrix spike analyses was above the 20% target upper limit. This deviation may be due to sample inhomogeneity.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10424250

Appendix A

Sample Management



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:	COC Type:	Page: 1 of
Turnaround Time:	COC ID:	FOR LAB USE ONLY
PROJECT/CLIENT INFO		LABORATORY
Facility Code: MPCA Freeway LF Soils	Program Code (MDH Lab Only):	Lab Name:
Project Name: MPCA Freeway LF Soils	Project Task Code:	Address:
Project Manager:	EPIC Profile # 38716	
Potential Hazard?	If yes, add information to Sampler Comments Section	
		Phone No:

Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED									
SAMPLE TYPE CODES			LAB MATRIX CODES				FIELD MATRIX CODES				ANALYSIS PRESERV.	See attachment for soil/s/consist	Diagnosis	Lab Sample No.	#					
Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont										
FD-SB-A5 (15-17) WM	3/20/18	1300	15'	17'	C	SD	WM			11	X	X	007	1						
FD-SB-A4 (15-23) S	3/20/18	1510	21.5'	23'	C	SD	S			10	X			2						
														3						
														4						
														5						
														6						
														7						
														8						
														9						
														10						

WO#: 10424250

 10424250

Sampled By: Chris Pelosi Sampler's Signature: *Chris Pelosi* Phone #: 612-597-7254

Receiving Comments:			
Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <i>Chris Pelosi</i> Pace	3/20/18 1655	<i>MCA</i> Pace	3/20/18 1655

T=8.1

Sample Condition Upon Receipt

Client Name: MPPA Project #: _____

WO#: 10424250
 PM: **BM2** Due Date: **04/03/18**
 CLIENT: **PASI-MNFLD**

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: PEB Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 8.1 Cooler Temp Corrected (°C): 8.3 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 40.2 Date and Initials of Person Examining Contents: 3/20/18 SD

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Headpace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No

Comments/Resolution: Received during cool down phase.

Project Manager Review:

Signatures

Date: 03/21/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10424250

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A5 (15-17)		
Lab Sample ID	10424250001		
Filename	Y180330B_05		
Injected By	BAL		
Total Amount Extracted	11.8 g	Matrix	Solid
% Moisture	32.2	Dilution	NA
Dry Weight Extracted	8.00 g	Collected	03/20/2018 13:00
ICAL ID	Y180204	Received	03/20/2018 16:55
CCal Filename(s)	Y180330B_01 & Y180330B_16	Extracted	03/22/2018 14:55
Method Blank ID	BLANK-61235	Analyzed	03/30/2018 16:39

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	19	----	1.0	2,3,7,8-TCDD-13C	2.00	57
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	61

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61235	Matrix	Solid
Filename	Y180329A_10	Dilution	NA
Total Amount Extracted	75.2 g	Extracted	03/22/2018 14:55
ICAL ID	Y180204	Analyzed	03/29/2018 20:08
CCal Filename(s)	Y180329A_01 & Y180329A_16	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	30 R
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	32

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61236	Matrix	Solid
Filename	Y180329A_04	Dilution	NA
Total Amount Extracted	75.5 g	Extracted	03/22/2018 14:55
ICAL ID	Y180204	Analyzed	03/29/2018 15:35
CCal Filename(s)	Y180329A_01 & Y180329A_16	Injected By	SMT
Method Blank ID	BLANK-61235		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.20	100	2,3,7,8-TCDD-13C	2.0	63
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	67

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spiked Sample Report

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A5 (15-17)-MS		
Lab Sample ID	10424250001-MS		
Filename	Y180330B_02	Matrix	Solid
Total Amount Extracted	11.7 g	Dilution	NA
ICAL ID	Y180204	Extracted	03/22/2018 14:55
CCal Filename(s)	Y180330B_01 & Y180330B_16	Analyzed	03/30/2018 14:23
Method Blank ID	BLANK-61235	Injected By	BAL

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.29	144 R	2,3,7,8-TCDD-37Cl4	0.20	64
				2,3,7,8-TCDD-13C	2.00	59

Qs = Quantity Spiked

Qm = Quantity Measured

Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spiked Sample Report

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A5 (15-17)-MSD		
Lab Sample ID	10424250001-MSD		
Filename	Y180330B_03	Matrix	Solid
Total Amount Extracted	11.8 g	Dilution	NA
ICAL ID	Y180204	Extracted	03/22/2018 14:55
CCal Filename(s)	Y180330B_01 & Y180330B_16	Analyzed	03/30/2018 15:08
Method Blank ID	BLANK-61235	Injected By	BAL

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.37	186 R	2,3,7,8-TCDD-37Cl4	0.20	69
				2,3,7,8-TCDD-13C	2.00	60

Qs = Quantity Spiked

Qm = Quantity Measured

Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spike Sample Results

Client - PACE Minnesota Field

Client Sample ID	FD-SB-A5 (15-17)			<u>Dry Weights</u>	
Lab Sample ID	10424250001	Sample Filename	Y180330B_05	Sample Amount	8.00 g
MS ID	10424250001-MS	MS Filename	Y180330B_02	MS Amount	7.9 g
MSD ID	10424250001-MSD	MSD Filename	Y180330B_03	MSD Amount	8.0 g

Analyte	Sample Conc. ng/Kg	MS/MSD Qs (ng)	MS Qm (ng)	MSD Qm (ng)	RPD	Background Subtracted		
						MS % Rec.	MSD % Rec.	RPD
2,3,7,8-TCDD	18.718	0.20	0.29	0.37	25.3	70	111	45.4

Definitions

MS = Matrix Spike	CDD = Chlorinated dibenzo-p-dioxin
MSD = Matrix Spike Duplicate	CDF = Chlorinated dibenzo-p-furan
Qm = Quantity Measured	T = Tetra
Qs = Quantity Spiked	Pe = Penta
% Rec. = Percent Recovery	Hx = Hexa
RPD = Relative Percent Difference	Hp = Hepta
NA = Not Applicable	O = Octa
NC = Not Calculated	

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

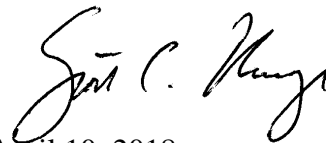
PaceProject#: 10424442
Sample Receipt Date: 03/21/2018
Client Project #: MPCA Freeway LF Soils
Client Sub PO #: 18-00383
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 10, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 10, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 42-73%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. In cases where the estimated detection limits (EDLs) were above the standard reporting limits, the EDLs were provided and flagged "A".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 95%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10424442

Appendix A

Sample Management

WO#: 10424442



Chain-of-Custody Form		Work Order Number: 10424442	Page: 1 of 1
PROJECT/CLIENT INFO		LABORATORY	
Facility Code: MPCA Freeway LF Soils	Program Code (MDH Lab Only):	Lab Name:	FOR LAB USE ONLY
Project Name: MPCA Freeway LF Soils	Project Task Code:	Address: 18-00383	
Project Manager:		GPIE Profile # 38716	
Potential Hazard?	If yes, add information to Sampler Comments Section	Phone No:	

SAMPLE DETAILS										ANALYSIS REQUESTED									
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES		PRESERV.	ANALYSIS	Lab Sample No.	#						
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS					Sampler Comments (filter volume, special handling, etc.)	# of Cont				
FD-WM-25 (15-17.5 m)	S	3/21/18	1005	15'	17.5'	C	SD	WM			13	X	X			001	1		
FD-WM-BS (3-10 m)	S	3/21/18	1145	3'	16'	C	SD	WM			12	X					2		
FD-WM-E5 (5-10 m)	S	3/21/18	1300	5'	10'	C	SD	WM			13	X	X			002	3		
FD-WM-F5 (3-11 m)	S	3/21/18	1530	3'	11'	C	SD	WM			13	X					4		
FD-WM-G5 (5-14 m)	S	3/21/18	1620	5'	14'	C	SD	WM			13	X	X			003	5		
FD-WM-F4 (5-10 m)	S	3/21/18	1650	5'	10'	C	SD	WM			13	X					6		
																	7		
																	8		
																	9		
																	10		

Sampled By: Chris Pelosi | Sampler's Signature: *Cliff P* | Phone #: 612-597-7254

Receiving Comments:			
Relinquished By/Affiliation <i>Cliff P</i>	Date/Time 3/21/18 1811	Accepted By/ Affiliation <i>Mary Vers Pace</i>	Date/Time 3/21/18 1812

T= 6.7, 9.4, 9.3, 7.1, 9.0°C

Sample Condition Upon Receipt

Client Name: Pace Field Project #: _____

WO# : 10424442
 PM: SCU Due Date: 04/05/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: FB Temp Blank? Yes No

Thermometer Used: 151401163 6.5, 9.1, 9.2, 10.9 G87A9155100842 7.8 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): _____ Cooler Temp Corrected (°C): 10.2 6.7, 9.4, 9.3, 7.1, 9.0 Biological Tissue Frozen? Yes No N/A

USDA Regulated Soil? Yes No N/A (water sample) Date and Initials of Person Examining Contents: 3/21/18 JS
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <u>3/21/18 JS</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>82</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 03/22/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluorine, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10424442

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-WM-C5 (15-17.5wm)		
Lab Sample ID	10424442001		
Filename	U180402B_10		
Injected By	SMT		
Total Amount Extracted	13.1 g	Matrix	Solid
% Moisture	29.0	Dilution	NA
Dry Weight Extracted	9.30 g	Collected	03/21/2018 10:05
ICAL ID	U171222	Received	03/21/2018 18:12
CCal Filename(s)	U180402B_01 & U180402B_14	Extracted	03/23/2018 17:15
Method Blank ID	BLANK-61285	Analyzed	04/03/2018 00:26

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	3.3	----	1.1 A	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	67

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-WM-E5 (5-10wm)		
Lab Sample ID	10424442002		
Filename	U180408A_16		
Injected By	ZMS		
Total Amount Extracted	12.7 g	Matrix	Solid
% Moisture	30.4	Dilution	NA
Dry Weight Extracted	8.84 g	Collected	03/21/2018 13:00
ICAL ID	U180405	Received	03/21/2018 18:12
CCal Filename(s)	U180408A_06 & U180408A_20	Extracted	03/23/2018 17:15
Method Blank ID	BLANK-61285	Analyzed	04/09/2018 02:44

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.5	----	1.4 A	2,3,7,8-TCDD-13C	2.00	42
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-WM-G5 (5-14wm)		
Lab Sample ID	10424442003		
Filename	U180409A_09		
Injected By	SMT		
Total Amount Extracted	13.1 g	Matrix	Solid
% Moisture	9.5	Dilution	NA
Dry Weight Extracted	11.9 g	Collected	03/21/2018 16:20
ICAL ID	U180405	Received	03/21/2018 18:12
CCal Filename(s)	U180409A_03 & U180409A_12	Extracted	03/23/2018 17:15
Method Blank ID	BLANK-61285	Analyzed	04/09/2018 19:53

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.2	----	1.0	2,3,7,8-TCDD-13C	2.00	45
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	48

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61285	Matrix	Solid
Filename	U180408A_12	Dilution	NA
Total Amount Extracted	20.3 g	Extracted	03/23/2018 17:15
ICAL ID	U180405	Analyzed	04/08/2018 23:30
CCal Filename(s)	U180408A_06 & U180408A_20	Injected By	ZMS

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	64

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61286	Matrix	Solid
Filename	U180408A_07	Dilution	NA
Total Amount Extracted	20.0 g	Extracted	03/23/2018 17:15
ICAL ID	U180405	Analyzed	04/08/2018 19:25
CCal Filename(s)	U180408A_06 & U180408A_20	Injected By	ZMS
Method Blank ID	BLANK-61285		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.19	95	2,3,7,8-TCDD-13C	2.0	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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April 09, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 21, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Alaska Certification UST-107
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Nevada DCNR Certification #: MN000372018-1
Montana DHHS Certification #: CERT0102

Minnesota Dept of Health Certification #: 1382680
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424443001	FD-WM-C5 (15-17.5 wm)	Solid	03/21/18 10:05	03/21/18 18:12
10424443002	FD-WM-D5 (5-16 wm)	Solid	03/21/18 11:45	03/21/18 18:12
10424443003	FD-WM-E5 (5-10 wm)	Solid	03/21/18 13:00	03/21/18 18:12
10424443004	FD-WM-F5 (3-11 wm)	Solid	03/21/18 15:30	03/21/18 18:12
10424443005	FD-WM-G5 (5-14 wm)	Solid	03/21/18 16:20	03/21/18 18:12
10424443006	FD-WM-F4 (5-10 wm)	Solid	03/21/18 16:50	03/21/18 18:12

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	LPM	2	PASI-M		
		EPA 6010C	IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	PW1	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8270D	STB	12	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10424443002	FD-WM-D5 (5-16 wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	LPM			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	PW1			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8270D	STB			12	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10424443003	FD-WM-E5 (5-10 wm)			EPA 1630 (1998)	CPK	1	PASI-DUL

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424443004	FD-WM-F5 (3-11 wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424443005	FD-WM-G5 (5-14 wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424443006	FD-WM-F4 (5-10 wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-C5 (15-17.5 wm)** Lab ID: **10424443001** Collected: 03/21/18 10:05 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.5	1	03/30/18 11:35	04/02/18 16:06	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	309-00-2	
alpha-BHC	ND	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	319-84-6	
beta-BHC	ND	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	319-85-7	
delta-BHC	ND	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	58-89-9	
Chlordane (Technical)	ND	ug/kg	469	20	03/22/18 12:24	04/03/18 23:32	57-74-9	
alpha-Chlordane	94.9	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	5103-71-9	
gamma-Chlordane	57.2	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	5103-74-2	
4,4'-DDD	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	72-54-8	
4,4'-DDE	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	72-55-9	
4,4'-DDT	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	50-29-3	
Dieldrin	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	60-57-1	
Endosulfan I	ND	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	959-98-8	
Endosulfan II	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	33213-65-9	
Endosulfan sulfate	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	1031-07-8	
Endrin	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	72-20-8	
Endrin aldehyde	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	7421-93-4	
Endrin ketone	ND	ug/kg	93.5	20	03/22/18 12:24	04/03/18 23:32	53494-70-5	
Heptachlor	ND	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	76-44-8	
Heptachlor epoxide	ND	ug/kg	46.9	20	03/22/18 12:24	04/03/18 23:32	1024-57-3	
Methoxychlor	ND	ug/kg	469	20	03/22/18 12:24	04/03/18 23:32	72-43-5	
Toxaphene	ND	ug/kg	1400	20	03/22/18 12:24	04/03/18 23:32	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/22/18 12:24	04/03/18 23:32	877-09-8	6M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	20	03/22/18 12:24	04/03/18 23:32	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	11141-16-5	
PCB-1242 (Aroclor 1242)	1120	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	12672-29-6	
PCB-1254 (Aroclor 1254)	1100	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	37324-23-5	
PCB-1268 (Aroclor 1268)	133	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	11100-14-4	
PCB, Total	2350	ug/kg	46.3	1	03/23/18 09:26	03/26/18 14:22	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	83	%	48-125	1	03/23/18 09:26	03/26/18 14:22	877-09-8	
Decachlorobiphenyl (S)	91	%	30-134	1	03/23/18 09:26	03/26/18 14:22	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-C5 (15-17.5 wm) Lab ID: 10424443001 Collected: 03/21/18 10:05 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	4630	mg/kg	2690	20	03/22/18 16:48	03/23/18 09:23		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	03/22/18 16:48	03/23/18 09:23	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	122	mg/kg	24.8	1	03/30/18 14:11	03/30/18 20:29		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	03/30/18 14:11	03/30/18 20:29	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	11900	mg/kg	13.7	1	03/26/18 05:53	03/29/18 17:11	7429-90-5	P6,R1
Barium	292	mg/kg	0.68	1	03/26/18 05:53	03/29/18 17:11	7440-39-3	P6
Boron	26.6	mg/kg	10.3	1	03/26/18 05:53	03/29/18 17:11	7440-42-8	M1
Copper	228	mg/kg	6.8	10	03/26/18 05:53	03/30/18 09:45	7440-50-8	P6,R1
Iron	15900	mg/kg	34.2	10	03/26/18 05:53	03/30/18 09:45	7439-89-6	M6,R1
Manganese	249	mg/kg	0.34	1	03/26/18 05:53	03/29/18 17:11	7439-96-5	P6
Nickel	112	mg/kg	13.7	10	03/26/18 05:53	03/30/18 09:45	7440-02-0	M6,R1
Silver	1.8	mg/kg	0.68	1	03/26/18 05:53	03/29/18 17:11	7440-22-4	
Tin	186	mg/kg	5.1	1	03/26/18 05:53	03/29/18 17:11	7440-31-5	M1
Titanium	275	mg/kg	1.7	1	03/26/18 05:53	03/29/18 17:11	7440-32-6	M1,R1
Zinc	86700	mg/kg	27.3	20	03/26/18 05:53	03/30/18 11:03	7440-66-6	M6,R1
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	26.1	mg/kg	1.3	5	03/30/18 09:43	03/31/18 05:37	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.0	mg/kg	0.70	20	03/26/18 09:32	04/02/18 11:55	7440-36-0	M6
Arsenic	14.3	mg/kg	0.70	20	03/26/18 09:32	04/02/18 11:55	7440-38-2	
Beryllium	0.36	mg/kg	0.28	20	03/26/18 09:32	04/02/18 11:55	7440-41-7	
Cadmium	4.6	mg/kg	0.11	20	03/26/18 09:32	04/02/18 11:55	7440-43-9	
Cobalt	37.4	mg/kg	0.70	20	03/26/18 09:32	04/02/18 11:55	7440-48-4	M6,R1
Lead	724	mg/kg	0.14	20	03/26/18 09:32	04/02/18 11:55	7439-92-1	M6,R1
Lithium	6.7	mg/kg	0.70	20	03/26/18 09:32	04/02/18 11:55	7439-93-2	
Selenium	0.82	mg/kg	0.70	20	03/26/18 09:32	04/02/18 11:55	7782-49-2	
Strontium	106	mg/kg	0.70	20	03/26/18 09:32	04/02/18 11:55	7440-24-6	M6
Vanadium	27.4	mg/kg	1.4	20	03/26/18 09:32	04/02/18 11:55	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.76	mg/kg	0.028	1	03/30/18 08:32	03/30/18 10:56	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	29.0	%	0.10	1		03/22/18 11:43		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-C5 (15-17.5 wm)** Lab ID: **10424443001** Collected: 03/21/18 10:05 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	208-96-8	
Anthracene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	120-12-7	
Benzo(a)anthracene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	56-55-3	
Benzo(a)pyrene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	101-55-3	
Butylbenzylphthalate	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	85-68-7	
Carbazole	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	59-50-7	
4-Chloroaniline	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	108-60-1	
2-Chloronaphthalene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	91-58-7	
2-Chlorophenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	7005-72-3	
Chrysene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	53-70-3	
Dibenzofuran	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	120-83-2	
Diethylphthalate	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	105-67-9	
Dimethylphthalate	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	131-11-3	
Di-n-butylphthalate	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	23900	1	03/22/18 11:24	04/04/18 22:08	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	606-20-2	
Di-n-octylphthalate	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	122-66-7	
bis(2-Ethylhexyl)phthalate	247000	ug/kg	23200	5	03/22/18 11:24	04/05/18 12:39	117-81-7	
Fluoranthene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	206-44-0	
Fluorene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	87-68-3	
Hexachlorobenzene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	118-74-1	
Hexachloroethane	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	193-39-5	
Isophorone	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	78-59-1	
1-Methylnaphthalene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	90-12-0	
2-Methylnaphthalene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-C5 (15-17.5 wm)** Lab ID: **10424443001** Collected: 03/21/18 10:05 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	9290	1	03/22/18 11:24	04/04/18 22:08		
Naphthalene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	91-20-3	
2-Nitroaniline	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	88-74-4	
3-Nitroaniline	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	99-09-2	
4-Nitroaniline	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	100-01-6	
Nitrobenzene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	98-95-3	
2-Nitrophenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	88-75-5	
4-Nitrophenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	86-30-6	
Pentachlorophenol	ND	ug/kg	9430	1	03/22/18 11:24	04/04/18 22:08	87-86-5	
Phenanthrene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	85-01-8	
Phenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	108-95-2	
Pyrene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	4640	1	03/22/18 11:24	04/04/18 22:08	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	1	03/22/18 11:24	04/04/18 22:08	4165-60-0	D4,P3, S4
2-Fluorobiphenyl (S)	0	%	30-132	1	03/22/18 11:24	04/04/18 22:08	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	1	03/22/18 11:24	04/04/18 22:08	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	1	03/22/18 11:24	04/04/18 22:08	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	1	03/22/18 11:24	04/04/18 22:08	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	1	03/22/18 11:24	04/04/18 22:08	118-79-6	S4

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	83-32-9	
Acenaphthylene	ND	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	208-96-8	
Anthracene	ND	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	120-12-7	
Benzo(a)anthracene	1420	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	56-55-3	
Benzo(a)pyrene	1710	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	50-32-8	
Benzo(b)fluoranthene	2170	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	205-99-2	
Benzo(g,h,i)perylene	1080	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	191-24-2	
Benzo(k)fluoranthene	787	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	207-08-9	
Chrysene	1510	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	53-70-3	
Fluoranthene	2870	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	206-44-0	
Fluorene	ND	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	86-73-7	
Indeno(1,2,3-cd)pyrene	843	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	193-39-5	
Naphthalene	ND	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	91-20-3	
Phenanthrene	1270	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	85-01-8	
Pyrene	2240	ug/kg	702	5	03/26/18 11:34	03/28/18 11:47	129-00-0	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-C5 (15-17.5 wm) Lab ID: 10424443001 Collected: 03/21/18 10:05 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	5	03/26/18 11:34	03/28/18 11:47	321-60-8	D3,P3, S0
p-Terphenyl-d14 (S)	0	%	57-125	5	03/26/18 11:34	03/28/18 11:47	1718-51-0	S0
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	25057-89-0	
2,4-D	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	94-75-7	
2,4-DB	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	94-82-6	
Dicamba	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	1918-00-9	
Dinoseb	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	88-85-7	
MCPA	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	94-74-6	
Pentachlorophenol	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	87-86-5	
Picloram	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	1918-02-1	
2,4,5-T	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	93-72-1	
Triclopyr	ND	mg/kg	0.46	10	03/23/18 07:54	03/29/18 17:10	55335-06-3	
Surrogates								
2,4-DCAA (S)	0	%	46-125	10	03/23/18 07:54	03/29/18 17:10	19719-28-9	D3,S4
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1830	1	03/26/18 09:03	03/26/18 12:04	67-64-1	
Allyl chloride	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	107-05-1	
Benzene	ND	ug/kg	36.7	1	03/26/18 09:03	03/26/18 12:04	71-43-2	
Bromobenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	108-86-1	
Bromochloromethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	74-97-5	
Bromodichloromethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	75-27-4	
Bromoform	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	75-25-2	
Bromomethane	ND	ug/kg	917	1	03/26/18 09:03	03/26/18 12:04	74-83-9	
2-Butanone (MEK)	ND	ug/kg	458	1	03/26/18 09:03	03/26/18 12:04	78-93-3	
n-Butylbenzene	614	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	104-51-8	
sec-Butylbenzene	372	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	135-98-8	
tert-Butylbenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	98-06-6	
Carbon tetrachloride	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	56-23-5	
Chlorobenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	108-90-7	
Chloroethane	ND	ug/kg	917	1	03/26/18 09:03	03/26/18 12:04	75-00-3	
Chloroform	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	67-66-3	
Chloromethane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	74-87-3	
2-Chlorotoluene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	95-49-8	
4-Chlorotoluene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	917	1	03/26/18 09:03	03/26/18 12:04	96-12-8	
Dibromochloromethane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	106-93-4	
Dibromomethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	541-73-1	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-C5 (15-17.5 wm)** Lab ID: **10424443001** Collected: 03/21/18 10:05 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,4-Dichlorobenzene	469	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	75-71-8	
1,1-Dichloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	75-34-3	
1,2-Dichloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	107-06-2	
1,1-Dichloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	156-60-5	
Dichlorofluoromethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	75-43-4	
1,2-Dichloropropane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	78-87-5	
1,3-Dichloropropane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	142-28-9	
2,2-Dichloropropane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	594-20-7	
1,1-Dichloropropene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	60-29-7	
Ethylbenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	458	1	03/26/18 09:03	03/26/18 12:04	87-68-3	
Isopropylbenzene (Cumene)	558	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	98-82-8	
p-Isopropyltoluene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	99-87-6	
Methylene Chloride	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	458	1	03/26/18 09:03	03/26/18 12:04	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	1634-04-4	
Naphthalene	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	91-20-3	
n-Propylbenzene	474	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	103-65-1	
Styrene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	79-34-5	N2
Tetrachloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	127-18-4	
Tetrahydrofuran	ND	ug/kg	3670	1	03/26/18 09:03	03/26/18 12:04	109-99-9	
Toluene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	79-00-5	
Trichloroethene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	367	1	03/26/18 09:03	03/26/18 12:04	76-13-1	
1,2,4-Trimethylbenzene	123	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	91.7	1	03/26/18 09:03	03/26/18 12:04	108-67-8	
Vinyl chloride	ND	ug/kg	36.7	1	03/26/18 09:03	03/26/18 12:04	75-01-4	
Xylene (Total)	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 12:04	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%	75-125	1	03/26/18 09:03	03/26/18 12:04	17060-07-0	
Toluene-d8 (S)	95	%	75-125	1	03/26/18 09:03	03/26/18 12:04	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	03/26/18 09:03	03/26/18 12:04	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-C5 (15-17.5 wm) Lab ID: 10424443001 Collected: 03/21/18 10:05 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	14.0	5	03/30/18 14:00	04/03/18 12:08	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	26.1	mg/kg	1.0	1		04/05/18 07:42	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	0.39	1	03/29/18 10:55	03/29/18 13:00	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	1.0	1	03/30/18 14:00	03/31/18 04:44	16984-48-8	

Sample: FD-WM-D5 (5-16 wm) Lab ID: 10424443002 Collected: 03/21/18 11:45 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.2	1	03/30/18 11:35	04/02/18 16:12	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	309-00-2	
alpha-BHC	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	319-84-6	
beta-BHC	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	319-85-7	
delta-BHC	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	58-89-9	
Chlordane (Technical)	ND	ug/kg	1020	50	03/22/18 12:24	04/03/18 23:14	57-74-9	
alpha-Chlordane	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	5103-71-9	
gamma-Chlordane	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	5103-74-2	
4,4'-DDD	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	72-54-8	
4,4'-DDE	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	72-55-9	
4,4'-DDT	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	50-29-3	
Dieldrin	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	60-57-1	
Endosulfan I	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	959-98-8	
Endosulfan II	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	33213-65-9	
Endosulfan sulfate	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	1031-07-8	
Endrin	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	72-20-8	
Endrin aldehyde	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	7421-93-4	
Endrin ketone	ND	ug/kg	202	50	03/22/18 12:24	04/03/18 23:14	53494-70-5	
Heptachlor	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	76-44-8	
Heptachlor epoxide	ND	ug/kg	102	50	03/22/18 12:24	04/03/18 23:14	1024-57-3	
Methoxychlor	ND	ug/kg	1020	50	03/22/18 12:24	04/03/18 23:14	72-43-5	
Toxaphene	ND	ug/kg	3040	50	03/22/18 12:24	04/03/18 23:14	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	03/22/18 12:24	04/03/18 23:14	877-09-8	4M, D3, S4

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Sample Project No.: 10424443

Sample: FD-WM-D5 (5-16 wm) Lab ID: 10424443002 Collected: 03/21/18 11:45 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	0	%.	30-150	50	03/22/18 12:24	04/03/18 23:14	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	11141-16-5	
PCB-1242 (Aroclor 1242)	724	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	12672-29-6	
PCB-1254 (Aroclor 1254)	436	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	11100-14-4	
PCB, Total	1160	ug/kg	40.1	1	03/23/18 09:26	03/26/18 13:21	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	85	%.	48-125	1	03/23/18 09:26	03/26/18 13:21	877-09-8	
Decachlorobiphenyl (S)	85	%.	30-134	1	03/23/18 09:26	03/26/18 13:21	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1730	mg/kg	496	20	03/22/18 16:48	03/23/18 09:16		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	03/22/18 16:48	03/23/18 09:16	638-68-6	S4
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	40.9	mg/kg	13.8	1	03/30/18 14:11	03/30/18 20:53		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	03/30/18 14:11	03/30/18 20:53	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7130	mg/kg	12.0	1	03/26/18 05:53	03/29/18 17:31	7429-90-5	
Barium	191	mg/kg	0.60	1	03/26/18 05:53	03/29/18 17:31	7440-39-3	
Boron	58.6	mg/kg	9.0	1	03/26/18 05:53	03/29/18 17:31	7440-42-8	
Copper	23.7	mg/kg	0.60	1	03/26/18 05:53	03/29/18 17:31	7440-50-8	
Iron	17600	mg/kg	15.0	5	03/26/18 05:53	03/30/18 10:04	7439-89-6	
Manganese	263	mg/kg	0.30	1	03/26/18 05:53	03/29/18 17:31	7439-96-5	
Nickel	17.3	mg/kg	1.2	1	03/26/18 05:53	03/29/18 17:31	7440-02-0	
Silver	ND	mg/kg	0.60	1	03/26/18 05:53	03/29/18 17:31	7440-22-4	
Tin	5.7	mg/kg	4.5	1	03/26/18 05:53	03/29/18 17:31	7440-31-5	
Titanium	169	mg/kg	1.5	1	03/26/18 05:53	03/29/18 17:31	7440-32-6	
Zinc	268	mg/kg	1.2	1	03/26/18 05:53	03/29/18 17:31	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	37.1	mg/kg	1.1	5	03/30/18 09:43	03/31/18 05:42	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-D5 (5-16 wm) Lab ID: 10424443002 Collected: 03/21/18 11:45 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	2.0	mg/kg	0.61	20	03/26/18 09:32	04/02/18 10:56	7440-36-0	
Arsenic	11.6	mg/kg	0.61	20	03/26/18 09:32	04/02/18 10:56	7440-38-2	
Beryllium	0.45	mg/kg	0.24	20	03/26/18 09:32	04/02/18 10:56	7440-41-7	
Cadmium	4.1	mg/kg	0.098	20	03/26/18 09:32	04/02/18 10:56	7440-43-9	
Cobalt	12.5	mg/kg	0.61	20	03/26/18 09:32	04/02/18 10:56	7440-48-4	
Lead	369	mg/kg	0.12	20	03/26/18 09:32	04/02/18 10:56	7439-92-1	
Lithium	5.0	mg/kg	0.61	20	03/26/18 09:32	04/02/18 10:56	7439-93-2	
Selenium	1.3	mg/kg	0.61	20	03/26/18 09:32	04/02/18 10:56	7782-49-2	
Strontium	53.8	mg/kg	0.61	20	03/26/18 09:32	04/02/18 10:56	7440-24-6	
Vanadium	25.7	mg/kg	1.2	20	03/26/18 09:32	04/02/18 10:56	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.13	mg/kg	0.022	1	03/30/18 08:32	03/30/18 10:58	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	18.0	%	0.10	1		03/22/18 11:44		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	83-32-9	
Acenaphthylene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	208-96-8	
Anthracene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	120-12-7	
Benzo(a)anthracene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	56-55-3	
Benzo(a)pyrene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	101-55-3	
Butylbenzylphthalate	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	85-68-7	
Carbazole	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	59-50-7	
4-Chloroaniline	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	108-60-1	
2-Chloronaphthalene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	91-58-7	
2-Chlorophenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	7005-72-3	
Chrysene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	53-70-3	
Dibenzofuran	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	120-83-2	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-D5 (5-16 wm)** Lab ID: **10424443002** Collected: 03/21/18 11:45 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Diethylphthalate	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	105-67-9	
Dimethylphthalate	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	131-11-3	
Di-n-butylphthalate	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	20700	1	03/22/18 11:24	04/04/18 22:37	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	606-20-2	
Di-n-octylphthalate	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	117-81-7	
Fluoranthene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	206-44-0	
Fluorene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	87-68-3	
Hexachlorobenzene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	118-74-1	
Hexachloroethane	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	193-39-5	
Isophorone	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	78-59-1	
1-Methylnaphthalene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	90-12-0	
2-Methylnaphthalene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	8030	1	03/22/18 11:24	04/04/18 22:37		
Naphthalene	7710	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	91-20-3	
2-Nitroaniline	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	88-74-4	
3-Nitroaniline	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	99-09-2	
4-Nitroaniline	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	100-01-6	
Nitrobenzene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	98-95-3	
2-Nitrophenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	88-75-5	
4-Nitrophenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	86-30-6	
Pentachlorophenol	ND	ug/kg	8150	1	03/22/18 11:24	04/04/18 22:37	87-86-5	
Phenanthrene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	85-01-8	
Phenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	108-95-2	
Pyrene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	4010	1	03/22/18 11:24	04/04/18 22:37	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	1	03/22/18 11:24	04/04/18 22:37	4165-60-0	P3,S4
2-Fluorobiphenyl (S)	0	%	30-132	1	03/22/18 11:24	04/04/18 22:37	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	1	03/22/18 11:24	04/04/18 22:37	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	1	03/22/18 11:24	04/04/18 22:37	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	1	03/22/18 11:24	04/04/18 22:37	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	1	03/22/18 11:24	04/04/18 22:37	118-79-6	S4

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-D5 (5-16 wm) Lab ID: 10424443002 Collected: 03/21/18 11:45 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	83-32-9	
Acenaphthylene	ND	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	208-96-8	
Anthracene	ND	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	120-12-7	
Benzo(a)anthracene	257	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	56-55-3	
Benzo(a)pyrene	275	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	50-32-8	
Benzo(b)fluoranthene	359	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	205-99-2	
Benzo(g,h,i)perylene	203	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	191-24-2	
Benzo(k)fluoranthene	124	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	207-08-9	
Chrysene	315	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	53-70-3	
Fluoranthene	567	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	206-44-0	
Fluorene	ND	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	86-73-7	
Indeno(1,2,3-cd)pyrene	138	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	193-39-5	
Naphthalene	1130	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	91-20-3	
Phenanthrene	431	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	85-01-8	
Pyrene	476	ug/kg	122	10	03/26/18 11:34	03/27/18 18:40	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	10	03/26/18 11:34	03/27/18 18:40	321-60-8	D3,S4
p-Terphenyl-d14 (S)	0	%.	57-125	10	03/26/18 11:34	03/27/18 18:40	1718-51-0	S4
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	25057-89-0	
2,4-D	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	94-75-7	
2,4-DB	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	94-82-6	
Dicamba	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	1918-00-9	
Dinoseb	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	88-85-7	
MCPA	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	94-74-6	
Pentachlorophenol	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	87-86-5	
Picloram	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	1918-02-1	
2,4,5-T	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	93-72-1	
Triclopyr	ND	mg/kg	0.40	10	03/23/18 07:54	03/29/18 17:25	55335-06-3	
Surrogates								
2,4-DCAA (S)	0	%.	46-125	10	03/23/18 07:54	03/29/18 17:25	19719-28-9	D3,S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1240	1	03/26/18 09:03	03/26/18 12:21	67-64-1	
Allyl chloride	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	107-05-1	
Benzene	ND	ug/kg	24.8	1	03/26/18 09:03	03/26/18 12:21	71-43-2	
Bromobenzene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	108-86-1	
Bromochloromethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	74-97-5	
Bromodichloromethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	75-27-4	
Bromoform	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	75-25-2	
Bromomethane	ND	ug/kg	619	1	03/26/18 09:03	03/26/18 12:21	74-83-9	
2-Butanone (MEK)	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 12:21	78-93-3	
n-Butylbenzene	154	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-D5 (5-16 wm)** Lab ID: **10424443002** Collected: 03/21/18 11:45 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
sec-Butylbenzene	91.6	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	135-98-8	
tert-Butylbenzene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	98-06-6	
Carbon tetrachloride	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	56-23-5	
Chlorobenzene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	108-90-7	
Chloroethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	75-00-3	
Chloroform	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	67-66-3	
Chloromethane	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	74-87-3	
2-Chlorotoluene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	95-49-8	
4-Chlorotoluene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	96-12-8	
Dibromochloromethane	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	106-93-4	
Dibromomethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	541-73-1	
1,4-Dichlorobenzene	137	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	75-71-8	
1,1-Dichloroethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	75-34-3	
1,2-Dichloroethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	107-06-2	
1,1-Dichloroethene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	156-60-5	
Dichlorofluoromethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	75-43-4	
1,2-Dichloropropane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	78-87-5	
1,3-Dichloropropane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	142-28-9	
2,2-Dichloropropane	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	594-20-7	
1,1-Dichloropropene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	60-29-7	
Ethylbenzene	85.4	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 12:21	87-68-3	
Isopropylbenzene (Cumene)	131	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	98-82-8	
p-Isopropyltoluene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	99-87-6	
Methylene Chloride	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	310	1	03/26/18 09:03	03/26/18 12:21	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	1634-04-4	
Naphthalene	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	91-20-3	
n-Propylbenzene	197	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	103-65-1	
Styrene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	79-34-5	N2
Tetrachloroethene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	127-18-4	
Tetrahydrofuran	ND	ug/kg	2480	1	03/26/18 09:03	03/26/18 12:21	109-99-9	
Toluene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

Sample: FD-WM-D5 (5-16 wm) Lab ID: 10424443002 Collected: 03/21/18 11:45 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,4-Trichlorobenzene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	79-00-5	
Trichloroethene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	248	1	03/26/18 09:03	03/26/18 12:21	76-13-1	
1,2,4-Trimethylbenzene	124	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	61.9	1	03/26/18 09:03	03/26/18 12:21	108-67-8	
Vinyl chloride	ND	ug/kg	24.8	1	03/26/18 09:03	03/26/18 12:21	75-01-4	
Xylene (Total)	534	ug/kg	186	1	03/26/18 09:03	03/26/18 12:21	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%.	75-125	1	03/26/18 09:03	03/26/18 12:21	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/26/18 09:03	03/26/18 12:21	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	03/26/18 09:03	03/26/18 12:21	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	24.4	10	03/30/18 14:00	04/03/18 12:08	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	37.1	mg/kg	1.0	1		04/05/18 07:42	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.54	mg/kg	0.28	1	03/29/18 10:55	03/29/18 13:01	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.98	1	03/30/18 14:00	04/02/18 20:17	16984-48-8	

Sample: FD-WM-E5 (5-10 wm) Lab ID: 10424443003 Collected: 03/21/18 13:00 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	10.0	1	03/30/18 11:35	04/02/18 16:19	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	309-00-2	
alpha-BHC	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	319-84-6	
beta-BHC	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	319-85-7	
delta-BHC	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	58-89-9	
Chlordane (Technical)	ND	ug/kg	4790	200	03/22/18 12:24	04/03/18 22:37	57-74-9	
alpha-Chlordane	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	5103-71-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-E5 (5-10 wm)** Lab ID: **10424443003** Collected: 03/21/18 13:00 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
gamma-Chlordane	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	5103-74-2	
4,4'-DDD	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	72-54-8	
4,4'-DDE	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	72-55-9	
4,4'-DDT	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	50-29-3	
Dieldrin	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	60-57-1	
Endosulfan I	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	959-98-8	
Endosulfan II	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	33213-65-9	
Endosulfan sulfate	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	1031-07-8	
Endrin	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	72-20-8	
Endrin aldehyde	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	7421-93-4	
Endrin ketone	ND	ug/kg	956	200	03/22/18 12:24	04/03/18 22:37	53494-70-5	
Heptachlor	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	76-44-8	
Heptachlor epoxide	ND	ug/kg	479	200	03/22/18 12:24	04/03/18 22:37	1024-57-3	
Methoxychlor	ND	ug/kg	4790	200	03/22/18 12:24	04/03/18 22:37	72-43-5	
Toxaphene	ND	ug/kg	14400	200	03/22/18 12:24	04/03/18 22:37	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	200	03/22/18 12:24	04/03/18 22:37	877-09-8	5M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	200	03/22/18 12:24	04/03/18 22:37	2051-24-3	S4
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA 3550						
PCB-1016 (Aroclor 1016)	ND	ug/kg	47.4	1	03/23/18 09:26	03/26/18 13:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	47.4	1	03/23/18 09:26	03/26/18 13:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	47.4	1	03/23/18 09:26	03/26/18 13:36	11141-16-5	
PCB-1242 (Aroclor 1242)	4460	ug/kg	947	20	03/23/18 09:26	03/27/18 08:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	47.4	1	03/23/18 09:26	03/26/18 13:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	47.4	1	03/23/18 09:26	03/26/18 13:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	47.4	1	03/23/18 09:26	03/26/18 13:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	47.4	1	03/23/18 09:26	03/26/18 13:36	37324-23-5	
PCB-1268 (Aroclor 1268)	13500	ug/kg	947	20	03/23/18 09:26	03/27/18 08:51	11100-14-4	
PCB, Total	17900	ug/kg	947	20	03/23/18 09:26	03/27/18 08:51	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	84	%	48-125	1	03/23/18 09:26	03/26/18 13:36	877-09-8	
Decachlorobiphenyl (S)	253	%	30-134	1	03/23/18 09:26	03/26/18 13:36	2051-24-3	S5
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	29.5	mg/kg	13.8	1	03/22/18 16:48	03/23/18 10:13		T6
Surrogates								
n-Triacontane (S)	93	%	50-150	1	03/22/18 16:48	03/23/18 10:13	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	35.5	mg/kg	19.1	1	03/30/18 14:11	03/30/18 21:18		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	03/30/18 14:11	03/30/18 21:18	98-08-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-E5 (5-10 wm)** Lab ID: **10424443003** Collected: 03/21/18 13:00 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8650	mg/kg	13.9	1	03/26/18 05:53	03/29/18 17:35	7429-90-5	
Barium	435	mg/kg	0.70	1	03/26/18 05:53	03/29/18 17:35	7440-39-3	
Boron	89.4	mg/kg	10.5	1	03/26/18 05:53	03/29/18 17:35	7440-42-8	
Copper	55.0	mg/kg	0.70	1	03/26/18 05:53	03/29/18 17:35	7440-50-8	
Iron	48700	mg/kg	17.4	5	03/26/18 05:53	03/30/18 10:08	7439-89-6	
Manganese	521	mg/kg	0.35	1	03/26/18 05:53	03/29/18 17:35	7439-96-5	
Nickel	105	mg/kg	1.4	1	03/26/18 05:53	03/29/18 17:35	7440-02-0	
Silver	ND	mg/kg	0.70	1	03/26/18 05:53	03/29/18 17:35	7440-22-4	
Tin	12.0	mg/kg	5.2	1	03/26/18 05:53	03/29/18 17:35	7440-31-5	
Titanium	330	mg/kg	1.7	1	03/26/18 05:53	03/29/18 17:35	7440-32-6	
Zinc	249	mg/kg	1.4	1	03/26/18 05:53	03/29/18 17:35	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	59.4	mg/kg	1.4	5	03/30/18 09:43	03/31/18 05:46	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	0.91	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:01	7440-36-0	
Arsenic	11.3	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:01	7440-38-2	
Beryllium	0.77	mg/kg	0.28	20	03/26/18 09:32	04/02/18 11:01	7440-41-7	
Cadmium	1.5	mg/kg	0.11	20	03/26/18 09:32	04/02/18 11:01	7440-43-9	
Cobalt	16.4	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:01	7440-48-4	
Lead	1010	mg/kg	0.14	20	03/26/18 09:32	04/02/18 11:01	7439-92-1	
Lithium	7.7	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:01	7439-93-2	
Selenium	1.9	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:01	7782-49-2	
Strontium	92.8	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:01	7440-24-6	
Vanadium	39.0	mg/kg	1.4	20	03/26/18 09:32	04/02/18 11:01	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.65	mg/kg	0.025	1	03/30/18 08:32	03/30/18 11:00	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	30.4	%	0.10	1		03/22/18 11:44		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	83-32-9	
Acenaphthylene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	208-96-8	
Anthracene	7540	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	120-12-7	
Benzo(a)anthracene	12800	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	56-55-3	
Benzo(a)pyrene	10600	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	50-32-8	
Benzo(b)fluoranthene	14200	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	205-99-2	
Benzo(g,h,i)perylene	5660	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	101-55-3	
Butylbenzylphthalate	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	85-68-7	
Carbazole	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-E5 (5-10 wm) Lab ID: 10424443003 Collected: 03/21/18 13:00 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
4-Chloro-3-methylphenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	59-50-7	
4-Chloroaniline	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	108-60-1	
2-Chloronaphthalene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	91-58-7	
2-Chlorophenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	7005-72-3	
Chrysene	12100	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	53-70-3	
Dibenzofuran	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	120-83-2	
Diethylphthalate	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	105-67-9	
Dimethylphthalate	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	131-11-3	
Di-n-butylphthalate	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	24400	1	03/22/18 11:24	04/04/18 23:05	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	606-20-2	
Di-n-octylphthalate	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	122-66-7	
bis(2-Ethylhexyl)phthalate	19700	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	117-81-7	
Fluoranthene	35700	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	206-44-0	
Fluorene	5980	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	87-68-3	
Hexachlorobenzene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	118-74-1	
Hexachloroethane	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	67-72-1	
Indeno(1,2,3-cd)pyrene	4980	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	193-39-5	
Isophorone	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	78-59-1	
1-Methylnaphthalene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	90-12-0	
2-Methylnaphthalene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	9470	1	03/22/18 11:24	04/04/18 23:05		
Naphthalene	10800	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	91-20-3	
2-Nitroaniline	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	88-74-4	
3-Nitroaniline	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	99-09-2	
4-Nitroaniline	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	100-01-6	
Nitrobenzene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	98-95-3	
2-Nitrophenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	88-75-5	
4-Nitrophenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	62-75-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-E5 (5-10 wm)** Lab ID: **10424443003** Collected: 03/21/18 13:00 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
N-Nitroso-di-n-propylamine	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	86-30-6	
Pentachlorophenol	ND	ug/kg	9620	1	03/22/18 11:24	04/04/18 23:05	87-86-5	
Phenanthrene	39900	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	85-01-8	
Phenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	108-95-2	
Pyrene	27700	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	4740	1	03/22/18 11:24	04/04/18 23:05	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	1	03/22/18 11:24	04/04/18 23:05	4165-60-0	P3,S4
2-Fluorobiphenyl (S)	0	%	30-132	1	03/22/18 11:24	04/04/18 23:05	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	1	03/22/18 11:24	04/04/18 23:05	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	1	03/22/18 11:24	04/04/18 23:05	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	1	03/22/18 11:24	04/04/18 23:05	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	1	03/22/18 11:24	04/04/18 23:05	118-79-6	S4
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	4170	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	83-32-9	
Acenaphthylene	1660	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	208-96-8	
Anthracene	10600	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	120-12-7	
Benzo(a)anthracene	16400	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	56-55-3	
Benzo(a)pyrene	13900	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	50-32-8	
Benzo(b)fluoranthene	17500	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	205-99-2	
Benzo(g,h,i)perylene	8530	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	191-24-2	
Benzo(k)fluoranthene	5500	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	207-08-9	
Chrysene	16300	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	218-01-9	
Dibenz(a,h)anthracene	2050	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	53-70-3	
Fluoranthene	41200	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	206-44-0	
Fluorene	6010	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	86-73-7	
Indeno(1,2,3-cd)pyrene	6940	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	193-39-5	
Naphthalene	19600	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	91-20-3	
Phenanthrene	33500	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	85-01-8	
Pyrene	29600	ug/kg	1430	10	03/26/18 11:34	03/27/18 19:02	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	10	03/26/18 11:34	03/27/18 19:02	321-60-8	D3,P3, S4
p-Terphenyl-d14 (S)	0	%	57-125	10	03/26/18 11:34	03/27/18 19:02	1718-51-0	S4
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	25057-89-0	
2,4-D	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	94-75-7	
2,4-DB	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	94-82-6	
Dicamba	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	1918-00-9	
Dinoseb	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	88-85-7	
MCPA	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	94-74-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-E5 (5-10 wm)** Lab ID: **10424443003** Collected: 03/21/18 13:00 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Pentachlorophenol	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	87-86-5	
Picloram	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	1918-02-1	
2,4,5-T	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	93-72-1	
Triclopyr	ND	mg/kg	0.47	10	03/23/18 07:54	03/29/18 17:39	55335-06-3	
Surrogates								
2,4-DCAA (S)	0	%.	46-125	10	03/23/18 07:54	03/29/18 17:39	19719-28-9	D3,S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1650	1	03/26/18 09:03	03/26/18 12:37	67-64-1	
Allyl chloride	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	107-05-1	
Benzene	ND	ug/kg	33.0	1	03/26/18 09:03	03/26/18 12:37	71-43-2	
Bromobenzene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	108-86-1	
Bromochloromethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	74-97-5	
Bromodichloromethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	75-27-4	
Bromoform	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	75-25-2	
Bromomethane	ND	ug/kg	825	1	03/26/18 09:03	03/26/18 12:37	74-83-9	
2-Butanone (MEK)	ND	ug/kg	413	1	03/26/18 09:03	03/26/18 12:37	78-93-3	
n-Butylbenzene	136	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	104-51-8	
sec-Butylbenzene	104	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	135-98-8	
tert-Butylbenzene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	98-06-6	
Carbon tetrachloride	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	56-23-5	
Chlorobenzene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	108-90-7	
Chloroethane	ND	ug/kg	825	1	03/26/18 09:03	03/26/18 12:37	75-00-3	
Chloroform	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	67-66-3	
Chloromethane	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	74-87-3	
2-Chlorotoluene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	95-49-8	
4-Chlorotoluene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	825	1	03/26/18 09:03	03/26/18 12:37	96-12-8	
Dibromochloromethane	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	106-93-4	
Dibromomethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	541-73-1	
1,4-Dichlorobenzene	433	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	75-71-8	
1,1-Dichloroethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	75-34-3	
1,2-Dichloroethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	107-06-2	
1,1-Dichloroethene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	156-60-5	
Dichlorofluoromethane	ND	ug/kg	825	1	03/26/18 09:03	03/26/18 12:37	75-43-4	
1,2-Dichloropropane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	78-87-5	
1,3-Dichloropropane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	142-28-9	
2,2-Dichloropropane	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	594-20-7	
1,1-Dichloropropene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	563-58-6	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-E5 (5-10 wm) Lab ID: 10424443003 Collected: 03/21/18 13:00 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
cis-1,3-Dichloropropene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	60-29-7	
Ethylbenzene	247	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	413	1	03/26/18 09:03	03/26/18 12:37	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	98-82-8	
p-Isopropyltoluene	179	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	99-87-6	
Methylene Chloride	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	413	1	03/26/18 09:03	03/26/18 12:37	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	1634-04-4	
Naphthalene	2370	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	91-20-3	
n-Propylbenzene	115	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	103-65-1	
Styrene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	79-34-5	N2
Tetrachloroethene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	127-18-4	
Tetrahydrofuran	ND	ug/kg	3300	1	03/26/18 09:03	03/26/18 12:37	109-99-9	
Toluene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	79-00-5	
Trichloroethene	ND	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	330	1	03/26/18 09:03	03/26/18 12:37	76-13-1	
1,2,4-Trimethylbenzene	390	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	95-63-6	
1,3,5-Trimethylbenzene	92.5	ug/kg	82.5	1	03/26/18 09:03	03/26/18 12:37	108-67-8	
Vinyl chloride	ND	ug/kg	33.0	1	03/26/18 09:03	03/26/18 12:37	75-01-4	
Xylene (Total)	596	ug/kg	248	1	03/26/18 09:03	03/26/18 12:37	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	03/26/18 09:03	03/26/18 12:37	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	03/26/18 09:03	03/26/18 12:37	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	03/26/18 09:03	03/26/18 12:37	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent ND mg/kg 287 100 03/30/18 14:00 04/03/18 12:08 18540-29-9 D3

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent **59.4** mg/kg 1.0 1 04/05/18 07:42 16065-83-1

9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide ND mg/kg 0.44 1 03/29/18 10:55 03/29/18 13:01 57-12-5

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-E5 (5-10 wm) Lab ID: 10424443003 Collected: 03/21/18 13:00 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	0.98	1	03/30/18 14:00	03/31/18 04:25	16984-48-8	

Sample: FD-WM-F5 (3-11 wm) Lab ID: 10424443004 Collected: 03/21/18 15:30 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.8	1	03/30/18 11:35	04/02/18 16:26	7439-97-6	N3

8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550

Aldrin	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	309-00-2	
alpha-BHC	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	319-84-6	
beta-BHC	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	319-85-7	
delta-BHC	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	58-89-9	
Chlordane (Technical)	ND	ug/kg	486	20	03/22/18 12:24	04/03/18 23:51	57-74-9	
alpha-Chlordane	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	5103-71-9	
gamma-Chlordane	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	5103-74-2	
4,4'-DDD	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	72-54-8	
4,4'-DDE	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	72-55-9	
4,4'-DDT	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	50-29-3	
Dieldrin	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	60-57-1	
Endosulfan I	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	959-98-8	
Endosulfan II	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	33213-65-9	
Endosulfan sulfate	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	1031-07-8	
Endrin	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	72-20-8	
Endrin aldehyde	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	7421-93-4	
Endrin ketone	ND	ug/kg	96.8	20	03/22/18 12:24	04/03/18 23:51	53494-70-5	
Heptachlor	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	76-44-8	
Heptachlor epoxide	ND	ug/kg	48.6	20	03/22/18 12:24	04/03/18 23:51	1024-57-3	
Methoxychlor	ND	ug/kg	486	20	03/22/18 12:24	04/03/18 23:51	72-43-5	
Toxaphene	ND	ug/kg	1450	20	03/22/18 12:24	04/03/18 23:51	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/22/18 12:24	04/03/18 23:51	877-09-8	6M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	03/22/18 12:24	04/03/18 23:51	2051-24-3	S4

8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550

PCB-1016 (Aroclor 1016)	ND	ug/kg	47.9	1	03/23/18 09:26	03/26/18 13:51	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	47.9	1	03/23/18 09:26	03/26/18 13:51	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	47.9	1	03/23/18 09:26	03/26/18 13:51	11141-16-5	
PCB-1242 (Aroclor 1242)	8060	ug/kg	240	5	03/23/18 09:26	03/27/18 08:06	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	47.9	1	03/23/18 09:26	03/26/18 13:51	12672-29-6	
PCB-1254 (Aroclor 1254)	449	ug/kg	47.9	1	03/23/18 09:26	03/26/18 13:51	11097-69-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-F5 (3-11 wm) Lab ID: 10424443004 Collected: 03/21/18 15:30 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1260 (Aroclor 1260)	ND	ug/kg	47.9	1	03/23/18 09:26	03/26/18 13:51	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	47.9	1	03/23/18 09:26	03/26/18 13:51	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	47.9	1	03/23/18 09:26	03/26/18 13:51	11100-14-4	
PCB, Total	8510	ug/kg	240	5	03/23/18 09:26	03/27/18 08:06	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	96	%	48-125	1	03/23/18 09:26	03/26/18 13:51	877-09-8	
Decachlorobiphenyl (S)	110	%	30-134	1	03/23/18 09:26	03/26/18 13:51	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	4600	mg/kg	2290	20	03/22/18 16:48	03/23/18 09:30		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	20	03/22/18 16:48	03/23/18 09:30	638-68-6	S4
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	135	mg/kg	24.3	1	03/30/18 14:11	03/30/18 21:42		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	03/30/18 14:11	03/30/18 21:42	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10500	mg/kg	14.6	1	03/26/18 05:53	03/29/18 17:39	7429-90-5	
Barium	136	mg/kg	0.73	1	03/26/18 05:53	03/29/18 17:39	7440-39-3	
Boron	120	mg/kg	10.9	1	03/26/18 05:53	03/29/18 17:39	7440-42-8	
Copper	26.2	mg/kg	0.73	1	03/26/18 05:53	03/29/18 17:39	7440-50-8	
Iron	31000	mg/kg	18.2	5	03/26/18 05:53	03/30/18 10:12	7439-89-6	
Manganese	174	mg/kg	0.36	1	03/26/18 05:53	03/29/18 17:39	7439-96-5	
Nickel	28.3	mg/kg	1.5	1	03/26/18 05:53	03/29/18 17:39	7440-02-0	
Silver	ND	mg/kg	0.73	1	03/26/18 05:53	03/29/18 17:39	7440-22-4	
Tin	ND	mg/kg	5.5	1	03/26/18 05:53	03/29/18 17:39	7440-31-5	
Titanium	509	mg/kg	1.8	1	03/26/18 05:53	03/29/18 17:39	7440-32-6	
Zinc	160	mg/kg	1.5	1	03/26/18 05:53	03/29/18 17:39	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	39.6	mg/kg	1.3	5	03/30/18 09:43	03/31/18 05:51	7440-47-3	N2
6020A MET ICPMS								
Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	0.90	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:06	7440-36-0	
Arsenic	21.9	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:06	7440-38-2	
Beryllium	2.7	mg/kg	0.28	20	03/26/18 09:32	04/02/18 11:06	7440-41-7	
Cadmium	2.3	mg/kg	0.11	20	03/26/18 09:32	04/02/18 11:06	7440-43-9	
Cobalt	8.5	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:06	7440-48-4	
Lead	23.2	mg/kg	0.14	20	03/26/18 09:32	04/02/18 11:06	7439-92-1	
Lithium	9.2	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:06	7439-93-2	
Selenium	6.2	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:06	7782-49-2	
Strontium	62.3	mg/kg	0.71	20	03/26/18 09:32	04/02/18 11:06	7440-24-6	
Vanadium	83.8	mg/kg	1.4	20	03/26/18 09:32	04/02/18 11:06	7440-62-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-F5 (3-11 wm)** Lab ID: **10424443004** Collected: 03/21/18 15:30 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.19	mg/kg	0.028	1	03/30/18 08:32	03/30/18 11:02	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	31.3	%	0.10	1		03/22/18 11:44		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	83-32-9	
Acenaphthylene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	208-96-8	
Anthracene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	120-12-7	
Benzo(a)anthracene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	56-55-3	
Benzo(a)pyrene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	101-55-3	
Butylbenzylphthalate	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	85-68-7	
Carbazole	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	59-50-7	
4-Chloroaniline	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	108-60-1	
2-Chloronaphthalene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	91-58-7	
2-Chlorophenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	7005-72-3	
Chrysene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	53-70-3	
Dibenzofuran	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	120-83-2	
Diethylphthalate	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	105-67-9	
Dimethylphthalate	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	131-11-3	
Di-n-butylphthalate	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	24700	1	03/22/18 11:24	04/04/18 23:34	534-52-1	M1
2,4-Dinitrophenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	51-28-5	M1
2,4-Dinitrotoluene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	606-20-2	
Di-n-octylphthalate	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	117-81-7	
Fluoranthene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	206-44-0	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-F5 (3-11 wm) Lab ID: 10424443004 Collected: 03/21/18 15:30 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

Fluorene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	87-68-3	
Hexachlorobenzene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	118-74-1	
Hexachloroethane	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	67-72-1	M1
Indeno(1,2,3-cd)pyrene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	193-39-5	
Isophorone	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	78-59-1	
1-Methylnaphthalene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	90-12-0	
2-Methylnaphthalene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	9590	1	03/22/18 11:24	04/04/18 23:34		
Naphthalene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	91-20-3	M1
2-Nitroaniline	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	88-74-4	
3-Nitroaniline	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	99-09-2	
4-Nitroaniline	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	100-01-6	
Nitrobenzene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	98-95-3	
2-Nitrophenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	88-75-5	
4-Nitrophenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	86-30-6	
Pentachlorophenol	ND	ug/kg	9740	1	03/22/18 11:24	04/04/18 23:34	87-86-5	
Phenanthrene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	85-01-8	
Phenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	108-95-2	
Pyrene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	4800	1	03/22/18 11:24	04/04/18 23:34	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	0	%	43-125	1	03/22/18 11:24	04/04/18 23:34	4165-60-0	P3,S4
2-Fluorobiphenyl (S)	0	%	30-132	1	03/22/18 11:24	04/04/18 23:34	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	1	03/22/18 11:24	04/04/18 23:34	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	1	03/22/18 11:24	04/04/18 23:34	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	1	03/22/18 11:24	04/04/18 23:34	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	1	03/22/18 11:24	04/04/18 23:34	118-79-6	S4

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	83-32-9	
Acenaphthylene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	208-96-8	
Anthracene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	120-12-7	
Benzo(a)anthracene	31.1	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	56-55-3	
Benzo(a)pyrene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	50-32-8	
Benzo(b)fluoranthene	33.5	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	207-08-9	
Chrysene	33.2	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	53-70-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-F5 (3-11 wm)** Lab ID: **10424443004** Collected: 03/21/18 15:30 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Fluoranthene	68.8	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	206-44-0	
Fluorene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	193-39-5	
Naphthalene	178	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	91-20-3	
Phenanthrene	61.6	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	85-01-8	
Pyrene	54.1	ug/kg	29.1	2	03/26/18 11:34	03/28/18 12:53	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	62	%.	42-125	2	03/26/18 11:34	03/28/18 12:53	321-60-8	D3
p-Terphenyl-d14 (S)	69	%.	57-125	2	03/26/18 11:34	03/28/18 12:53	1718-51-0	
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	25057-89-0	
2,4-D	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	94-75-7	
2,4-DB	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	94-82-6	
Dicamba	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	1918-00-9	
Dinoseb	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	88-85-7	
MCPA	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	94-74-6	
Pentachlorophenol	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	87-86-5	
Picloram	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	1918-02-1	
2,4,5-T	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	93-72-1	
Triclopyr	ND	mg/kg	0.24	5	03/23/18 07:54	03/29/18 16:55	55335-06-3	
Surrogates								
2,4-DCAA (S)	67	%.	46-125	5	03/23/18 07:54	03/29/18 16:55	19719-28-9	D3
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2550	1	03/26/18 09:03	03/26/18 12:54	67-64-1	
Allyl chloride	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	107-05-1	
Benzene	ND	ug/kg	51.0	1	03/26/18 09:03	03/26/18 12:54	71-43-2	
Bromobenzene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	108-86-1	
Bromochloromethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	74-97-5	
Bromodichloromethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	75-27-4	
Bromoform	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	75-25-2	
Bromomethane	ND	ug/kg	1270	1	03/26/18 09:03	03/26/18 12:54	74-83-9	
2-Butanone (MEK)	ND	ug/kg	637	1	03/26/18 09:03	03/26/18 12:54	78-93-3	
n-Butylbenzene	889	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	104-51-8	
sec-Butylbenzene	440	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	135-98-8	
tert-Butylbenzene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	98-06-6	
Carbon tetrachloride	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	56-23-5	
Chlorobenzene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	108-90-7	
Chloroethane	ND	ug/kg	1270	1	03/26/18 09:03	03/26/18 12:54	75-00-3	
Chloroform	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	67-66-3	
Chloromethane	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	74-87-3	
2-Chlorotoluene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	95-49-8	
4-Chlorotoluene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1270	1	03/26/18 09:03	03/26/18 12:54	96-12-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-F5 (3-11 wm)** Lab ID: **10424443004** Collected: 03/21/18 15:30 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Dibromochloromethane	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	106-93-4	
Dibromomethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	74-95-3	
1,2-Dichlorobenzene	173	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	95-50-1	
1,3-Dichlorobenzene	128	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	541-73-1	
1,4-Dichlorobenzene	547	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	75-71-8	
1,1-Dichloroethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	75-34-3	
1,2-Dichloroethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	107-06-2	
1,1-Dichloroethene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1270	1	03/26/18 09:03	03/26/18 12:54	75-43-4	
1,2-Dichloropropane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	78-87-5	
1,3-Dichloropropane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	142-28-9	
2,2-Dichloropropane	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	594-20-7	
1,1-Dichloropropene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	60-29-7	
Ethylbenzene	890	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	637	1	03/26/18 09:03	03/26/18 12:54	87-68-3	
Isopropylbenzene (Cumene)	755	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	98-82-8	
p-Isopropyltoluene	1160	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	99-87-6	
Methylene Chloride	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	637	1	03/26/18 09:03	03/26/18 12:54	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	1634-04-4	
Naphthalene	11200	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	91-20-3	
n-Propylbenzene	491	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	103-65-1	
Styrene	182	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	79-34-5	N2
Tetrachloroethene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	127-18-4	
Tetrahydrofuran	ND	ug/kg	5100	1	03/26/18 09:03	03/26/18 12:54	109-99-9	
Toluene	345	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	87-61-6	
1,2,4-Trichlorobenzene	470	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	79-00-5	
Trichloroethene	ND	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	510	1	03/26/18 09:03	03/26/18 12:54	76-13-1	
1,2,4-Trimethylbenzene	3200	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	95-63-6	
1,3,5-Trimethylbenzene	774	ug/kg	127	1	03/26/18 09:03	03/26/18 12:54	108-67-8	
Vinyl chloride	ND	ug/kg	51.0	1	03/26/18 09:03	03/26/18 12:54	75-01-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-F5 (3-11 wm) Lab ID: 10424443004 Collected: 03/21/18 15:30 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Xylene (Total)	1180	ug/kg	382	1	03/26/18 09:03	03/26/18 12:54	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1	03/26/18 09:03	03/26/18 12:54	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/26/18 09:03	03/26/18 12:54	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1	03/26/18 09:03	03/26/18 12:54	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	288	100	03/30/18 14:00	04/03/18 12:09	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	39.6	mg/kg	1.0	1		04/05/18 07:42	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.50	1	03/29/18 10:55	03/29/18 13:04	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.9	mg/kg	0.99	1	03/30/18 14:00	03/31/18 01:09	16984-48-8	M1

Sample: FD-WM-G5 (5-14 wm) Lab ID: 10424443005 Collected: 03/21/18 16:20 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	6.94	1	03/30/18 11:35	04/02/18 16:32	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	309-00-2	
alpha-BHC	ND	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	319-84-6	
beta-BHC	ND	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	319-85-7	
delta-BHC	ND	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	58-89-9	
Chlordane (Technical)	ND	ug/kg	184	10	03/22/18 12:24	04/03/18 19:16	57-74-9	
alpha-Chlordane	41.9	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	5103-71-9	M6, R1
gamma-Chlordane	23.4	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	5103-74-2	M6, R1
4,4'-DDD	41.9	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	72-54-8	M6
4,4'-DDE	ND	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	72-55-9	M6, R1
4,4'-DDT	ND	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	50-29-3	
Dieldrin	ND	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	60-57-1	
Endosulfan I	ND	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	959-98-8	
Endosulfan II	ND	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	33213-65-9	
Endosulfan sulfate	ND	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	1031-07-8	
Endrin	ND	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	72-20-8	
Endrin aldehyde	ND	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	7421-93-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-G5 (5-14 wm)** Lab ID: **10424443005** Collected: 03/21/18 16:20 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Endrin ketone	106	ug/kg	36.7	10	03/22/18 12:24	04/03/18 19:16	53494-70-5	M6
Heptachlor	ND	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	76-44-8	
Heptachlor epoxide	ND	ug/kg	18.4	10	03/22/18 12:24	04/03/18 19:16	1024-57-3	
Methoxychlor	ND	ug/kg	184	10	03/22/18 12:24	04/03/18 19:16	72-43-5	
Toxaphene	ND	ug/kg	551	10	03/22/18 12:24	04/03/18 19:16	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	03/22/18 12:24	04/03/18 19:16	877-09-8	7M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	10	03/22/18 12:24	04/03/18 19:16	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	36.4	1	03/23/18 09:26	03/26/18 14:07	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	36.4	1	03/23/18 09:26	03/26/18 14:07	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	36.4	1	03/23/18 09:26	03/26/18 14:07	11141-16-5	
PCB-1242 (Aroclor 1242)	14200	ug/kg	364	10	03/23/18 09:26	03/27/18 08:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	36.4	1	03/23/18 09:26	03/26/18 14:07	12672-29-6	
PCB-1254 (Aroclor 1254)	998	ug/kg	36.4	1	03/23/18 09:26	03/26/18 14:07	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	36.4	1	03/23/18 09:26	03/26/18 14:07	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	36.4	1	03/23/18 09:26	03/26/18 14:07	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	36.4	1	03/23/18 09:26	03/26/18 14:07	11100-14-4	
PCB, Total	15200	ug/kg	364	10	03/23/18 09:26	03/27/18 08:21	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	88	%	48-125	1	03/23/18 09:26	03/26/18 14:07	877-09-8	
Decachlorobiphenyl (S)	103	%	30-134	1	03/23/18 09:26	03/26/18 14:07	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	40.3	mg/kg	8.5	1	03/22/18 16:48	03/23/18 10:06		T6
Surrogates								
n-Triacontane (S)	98	%	50-150	1	03/22/18 16:48	03/23/18 10:06	638-68-6	
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.5	1	03/30/18 14:11	03/30/18 20:05		C0,M1
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	03/30/18 14:11	03/30/18 20:05	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4040	mg/kg	10.5	1	03/26/18 05:53	03/29/18 17:51	7429-90-5	
Barium	91.1	mg/kg	0.53	1	03/26/18 05:53	03/29/18 17:51	7440-39-3	
Boron	114	mg/kg	7.9	1	03/26/18 05:53	03/29/18 17:51	7440-42-8	
Copper	244	mg/kg	0.53	1	03/26/18 05:53	03/29/18 17:51	7440-50-8	
Iron	168000	mg/kg	52.6	20	03/26/18 05:53	03/30/18 10:16	7439-89-6	
Manganese	804	mg/kg	0.26	1	03/26/18 05:53	03/29/18 17:51	7439-96-5	
Nickel	42.9	mg/kg	1.1	1	03/26/18 05:53	03/29/18 17:51	7440-02-0	
Silver	ND	mg/kg	0.53	1	03/26/18 05:53	03/29/18 17:51	7440-22-4	
Tin	319	mg/kg	3.9	1	03/26/18 05:53	03/29/18 17:51	7440-31-5	
Titanium	148	mg/kg	1.3	1	03/26/18 05:53	03/29/18 17:51	7440-32-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-G5 (5-14 wm) Lab ID: 10424443005 Collected: 03/21/18 16:20 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Zinc	150	mg/kg	1.1	1	03/26/18 05:53	03/29/18 17:51	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	15.4	mg/kg	1.1	5	03/30/18 09:43	03/31/18 05:56	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.54	20	03/26/18 09:32	04/02/18 11:11	7440-36-0	
Arsenic	5.2	mg/kg	0.54	20	03/26/18 09:32	04/02/18 11:11	7440-38-2	
Beryllium	0.39	mg/kg	0.22	20	03/26/18 09:32	04/02/18 11:11	7440-41-7	
Cadmium	0.64	mg/kg	0.087	20	03/26/18 09:32	04/02/18 11:11	7440-43-9	
Cobalt	5.2	mg/kg	0.54	20	03/26/18 09:32	04/02/18 11:11	7440-48-4	
Lead	44.3	mg/kg	0.11	20	03/26/18 09:32	04/02/18 11:11	7439-92-1	
Lithium	4.7	mg/kg	0.54	20	03/26/18 09:32	04/02/18 11:11	7439-93-2	
Selenium	0.95	mg/kg	0.54	20	03/26/18 09:32	04/02/18 11:11	7782-49-2	
Strontium	28.4	mg/kg	0.54	20	03/26/18 09:32	04/02/18 11:11	7440-24-6	
Vanadium	20.2	mg/kg	1.1	20	03/26/18 09:32	04/02/18 11:11	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	1.5	mg/kg	0.10	5	03/30/18 08:32	03/30/18 11:12	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	9.5	%	0.10	1		03/22/18 11:44		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	83-32-9	
Acenaphthylene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	208-96-8	
Anthracene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	120-12-7	
Benzo(a)anthracene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	56-55-3	
Benzo(a)pyrene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	101-55-3	
Butylbenzylphthalate	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	85-68-7	
Carbazole	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	59-50-7	
4-Chloroaniline	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	108-60-1	
2-Chloronaphthalene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	91-58-7	
2-Chlorophenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	7005-72-3	
Chrysene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	53-70-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-G5 (5-14 wm)** Lab ID: **10424443005** Collected: 03/21/18 16:20 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Dibenzofuran	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	120-83-2	
Diethylphthalate	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	105-67-9	
Dimethylphthalate	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	131-11-3	
Di-n-butylphthalate	592	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1880	1	03/22/18 11:24	04/05/18 00:03	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	606-20-2	
Di-n-octylphthalate	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	122-66-7	
bis(2-Ethylhexyl)phthalate	830	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	117-81-7	
Fluoranthene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	206-44-0	
Fluorene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	87-68-3	
Hexachlorobenzene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	118-74-1	
Hexachloroethane	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	193-39-5	
Isophorone	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	78-59-1	
1-Methylnaphthalene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	90-12-0	
2-Methylnaphthalene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	729	1	03/22/18 11:24	04/05/18 00:03		
Naphthalene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	91-20-3	
2-Nitroaniline	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	88-74-4	
3-Nitroaniline	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	99-09-2	
4-Nitroaniline	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	100-01-6	
Nitrobenzene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	98-95-3	
2-Nitrophenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	88-75-5	
4-Nitrophenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	86-30-6	
Pentachlorophenol	ND	ug/kg	740	1	03/22/18 11:24	04/05/18 00:03	87-86-5	
Phenanthrene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	85-01-8	
Phenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	108-95-2	
Pyrene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	364	1	03/22/18 11:24	04/05/18 00:03	88-06-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-G5 (5-14 wm) Lab ID: 10424443005 Collected: 03/21/18 16:20 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

Surrogates

Nitrobenzene-d5 (S)	58	%.	43-125	1	03/22/18 11:24	04/05/18 00:03	4165-60-0	
2-Fluorobiphenyl (S)	64	%.	30-132	1	03/22/18 11:24	04/05/18 00:03	321-60-8	
p-Terphenyl-d14 (S)	71	%.	62-125	1	03/22/18 11:24	04/05/18 00:03	1718-51-0	
Phenol-d6 (S)	62	%.	48-125	1	03/22/18 11:24	04/05/18 00:03	13127-88-3	
2-Fluorophenol (S)	64	%.	40-125	1	03/22/18 11:24	04/05/18 00:03	367-12-4	
2,4,6-Tribromophenol (S)	63	%.	60-125	1	03/22/18 11:24	04/05/18 00:03	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	158	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	83-32-9	
Acenaphthylene	ND	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	208-96-8	
Anthracene	ND	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	120-12-7	
Benzo(a)anthracene	ND	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	56-55-3	
Benzo(a)pyrene	111	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	205-99-2	
Benzo(g,h,i)perylene	167	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	207-08-9	
Chrysene	144	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	53-70-3	
Fluoranthene	174	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	206-44-0	
Fluorene	118	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	193-39-5	
Naphthalene	1690	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	91-20-3	
Phenanthrene	415	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	85-01-8	
Pyrene	300	ug/kg	110	10	03/26/18 11:34	03/27/18 19:46	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	10	03/26/18 11:34	03/27/18 19:46	321-60-8	D3,S4
p-Terphenyl-d14 (S)	0	%.	57-125	10	03/26/18 11:34	03/27/18 19:46	1718-51-0	S4

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

Bentazon	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	25057-89-0	
2,4-D	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	94-75-7	
2,4-DB	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	94-82-6	
Dicamba	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	1918-00-9	
Dinoseb	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	88-85-7	
MCPA	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	94-74-6	
Pentachlorophenol	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	87-86-5	
Picloram	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	1918-02-1	
2,4,5-T	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	93-72-1	
Triclopyr	ND	mg/kg	0.36	10	03/23/18 07:54	03/29/18 17:54	55335-06-3	
Surrogates								
2,4-DCAA (S)	0	%.	46-125	10	03/23/18 07:54	03/29/18 17:54	19719-28-9	D3,S4

8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	ND	ug/kg	1060	1	03/26/18 09:03	03/26/18 13:11	67-64-1	
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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-G5 (5-14 wm) Lab ID: 10424443005 Collected: 03/21/18 16:20 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Allyl chloride	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	107-05-1	
Benzene	ND	ug/kg	21.1	1	03/26/18 09:03	03/26/18 13:11	71-43-2	
Bromobenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	108-86-1	
Bromochloromethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	74-97-5	
Bromodichloromethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	75-27-4	
Bromoform	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	75-25-2	
Bromomethane	ND	ug/kg	528	1	03/26/18 09:03	03/26/18 13:11	74-83-9	
2-Butanone (MEK)	ND	ug/kg	264	1	03/26/18 09:03	03/26/18 13:11	78-93-3	
n-Butylbenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	104-51-8	
sec-Butylbenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	135-98-8	
tert-Butylbenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	98-06-6	
Carbon tetrachloride	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	56-23-5	
Chlorobenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	108-90-7	
Chloroethane	ND	ug/kg	528	1	03/26/18 09:03	03/26/18 13:11	75-00-3	
Chloroform	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	67-66-3	
Chloromethane	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	74-87-3	
2-Chlorotoluene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	95-49-8	
4-Chlorotoluene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	528	1	03/26/18 09:03	03/26/18 13:11	96-12-8	
Dibromochloromethane	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	106-93-4	
Dibromomethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	75-71-8	
1,1-Dichloroethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	75-34-3	
1,2-Dichloroethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	107-06-2	
1,1-Dichloroethene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	156-60-5	
Dichlorofluoromethane	ND	ug/kg	528	1	03/26/18 09:03	03/26/18 13:11	75-43-4	
1,2-Dichloropropane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	78-87-5	
1,3-Dichloropropane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	142-28-9	
2,2-Dichloropropane	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	594-20-7	
1,1-Dichloropropene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	60-29-7	
Ethylbenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	264	1	03/26/18 09:03	03/26/18 13:11	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	98-82-8	
p-Isopropyltoluene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	99-87-6	
Methylene Chloride	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	264	1	03/26/18 09:03	03/26/18 13:11	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	1634-04-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-G5 (5-14 wm) Lab ID: 10424443005 Collected: 03/21/18 16:20 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Naphthalene	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	91-20-3	
n-Propylbenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	103-65-1	
Styrene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	79-34-5	N2
Tetrachloroethene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	127-18-4	
Tetrahydrofuran	ND	ug/kg	2110	1	03/26/18 09:03	03/26/18 13:11	109-99-9	
Toluene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	79-00-5	
Trichloroethene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	211	1	03/26/18 09:03	03/26/18 13:11	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	52.8	1	03/26/18 09:03	03/26/18 13:11	108-67-8	
Vinyl chloride	ND	ug/kg	21.1	1	03/26/18 09:03	03/26/18 13:11	75-01-4	
Xylene (Total)	ND	ug/kg	158	1	03/26/18 09:03	03/26/18 13:11	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	03/26/18 09:03	03/26/18 13:11	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	03/26/18 09:03	03/26/18 13:11	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	03/26/18 09:03	03/26/18 13:11	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent ND mg/kg 22.0 10 03/30/18 14:00 04/03/18 12:09 18540-29-9 D3

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent **15.4** mg/kg 1.0 1 04/05/18 07:42 16065-83-1

9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide ND mg/kg 0.42 1 03/29/18 10:55 03/29/18 13:04 57-12-5

9056 IC Anions

Analytical Method: EPA 9056A Preparation Method: EPA 300.0

Fluoride ND mg/kg 0.97 1 03/30/18 14:00 03/31/18 03:26 16984-48-8

Sample: FD-WM-F4 (5-10 wm) Lab ID: 10424443006 Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	15.6	1	03/30/18 11:35	04/02/18 16:39	7439-97-6	N3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-F4 (5-10 wm)** Lab ID: **10424443006** Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	309-00-2	
alpha-BHC	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	319-84-6	
beta-BHC	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	319-85-7	
delta-BHC	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	58-89-9	
Chlordane (Technical)	ND	ug/kg	4500	200	03/22/18 12:24	04/03/18 22:56	57-74-9	
alpha-Chlordane	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	5103-71-9	
gamma-Chlordane	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	5103-74-2	
4,4'-DDD	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	72-54-8	
4,4'-DDE	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	72-55-9	
4,4'-DDT	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	50-29-3	
Dieldrin	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	60-57-1	
Endosulfan I	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	959-98-8	
Endosulfan II	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	33213-65-9	
Endosulfan sulfate	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	1031-07-8	
Endrin	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	72-20-8	
Endrin aldehyde	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	7421-93-4	
Endrin ketone	ND	ug/kg	898	200	03/22/18 12:24	04/03/18 22:56	53494-70-5	
Heptachlor	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	76-44-8	
Heptachlor epoxide	ND	ug/kg	450	200	03/22/18 12:24	04/03/18 22:56	1024-57-3	
Methoxychlor	ND	ug/kg	4500	200	03/22/18 12:24	04/03/18 22:56	72-43-5	
Toxaphene	ND	ug/kg	13500	200	03/22/18 12:24	04/03/18 22:56	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	200	03/22/18 12:24	04/03/18 22:56	877-09-8	5M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	200	03/22/18 12:24	04/03/18 22:56	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.5	1	03/23/18 09:26	03/26/18 13:06	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.5	1	03/23/18 09:26	03/26/18 13:06	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.5	1	03/23/18 09:26	03/26/18 13:06	11141-16-5	
PCB-1242 (Aroclor 1242)	2110	ug/kg	89.0	2	03/23/18 09:26	03/27/18 08:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.5	1	03/23/18 09:26	03/26/18 13:06	12672-29-6	
PCB-1254 (Aroclor 1254)	457	ug/kg	44.5	1	03/23/18 09:26	03/26/18 13:06	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.5	1	03/23/18 09:26	03/26/18 13:06	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.5	1	03/23/18 09:26	03/26/18 13:06	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.5	1	03/23/18 09:26	03/26/18 13:06	11100-14-4	
PCB, Total	2570	ug/kg	89.0	2	03/23/18 09:26	03/27/18 08:36	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	105	%	48-125	1	03/23/18 09:26	03/26/18 13:06	877-09-8	
Decachlorobiphenyl (S)	96	%	30-134	1	03/23/18 09:26	03/26/18 13:06	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	6590	mg/kg	2230	20	03/22/18 16:48	03/23/18 09:09		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	20	03/22/18 16:48	03/23/18 09:09	638-68-6	S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-F4 (5-10 wm) Lab ID: 10424443006 Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	28.4	mg/kg	14.1	1	03/30/18 14:11	03/30/18 22:07		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	03/30/18 14:11	03/30/18 22:07	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3700	mg/kg	13.5	1	03/26/18 05:53	03/29/18 17:55	7429-90-5	
Barium	294	mg/kg	0.67	1	03/26/18 05:53	03/29/18 17:55	7440-39-3	
Boron	128	mg/kg	10.1	1	03/26/18 05:53	03/29/18 17:55	7440-42-8	
Copper	334	mg/kg	0.67	1	03/26/18 05:53	03/29/18 17:55	7440-50-8	
Iron	162000	mg/kg	67.5	20	03/26/18 05:53	03/30/18 10:20	7439-89-6	
Manganese	1060	mg/kg	0.34	1	03/26/18 05:53	03/29/18 17:55	7439-96-5	
Nickel	57.9	mg/kg	1.3	1	03/26/18 05:53	03/29/18 17:55	7440-02-0	
Silver	ND	mg/kg	0.67	1	03/26/18 05:53	03/29/18 17:55	7440-22-4	
Tin	19.3	mg/kg	5.1	1	03/26/18 05:53	03/29/18 17:55	7440-31-5	
Titanium	219	mg/kg	1.7	1	03/26/18 05:53	03/29/18 17:55	7440-32-6	
Zinc	483	mg/kg	1.3	1	03/26/18 05:53	03/29/18 17:55	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	59.7	mg/kg	1.3	5	03/30/18 09:43	03/31/18 06:00	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.0	mg/kg	0.66	20	03/26/18 09:32	04/02/18 11:31	7440-36-0	
Arsenic	12.1	mg/kg	0.66	20	03/26/18 09:32	04/02/18 11:31	7440-38-2	
Beryllium	0.35	mg/kg	0.26	20	03/26/18 09:32	04/02/18 11:31	7440-41-7	
Cadmium	1.3	mg/kg	0.10	20	03/26/18 09:32	04/02/18 11:31	7440-43-9	
Cobalt	8.2	mg/kg	0.66	20	03/26/18 09:32	04/02/18 11:31	7440-48-4	
Lead	424	mg/kg	0.13	20	03/26/18 09:32	04/02/18 11:31	7439-92-1	
Lithium	4.5	mg/kg	0.66	20	03/26/18 09:32	04/02/18 11:31	7439-93-2	
Selenium	ND	mg/kg	0.66	20	03/26/18 09:32	04/02/18 11:31	7782-49-2	
Strontium	148	mg/kg	0.66	20	03/26/18 09:32	04/02/18 11:31	7440-24-6	
Vanadium	14.9	mg/kg	1.3	20	03/26/18 09:32	04/02/18 11:31	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	1.5	mg/kg	0.13	5	03/30/18 08:32	03/30/18 11:20	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	25.9	%	0.10	1		03/22/18 11:45		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	83-32-9	
Acenaphthylene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	208-96-8	
Anthracene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	120-12-7	
Benzo(a)anthracene	10900	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	56-55-3	
Benzo(a)pyrene	7440	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	50-32-8	
Benzo(b)fluoranthene	9450	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	205-99-2	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-F4 (5-10 wm)** Lab ID: **10424443006** Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Benzo(g,h,i)perylene	5870	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	101-55-3	
Butylbenzylphthalate	468000	ug/kg	88800	20	03/22/18 11:24	04/05/18 12:10	85-68-7	
Carbazole	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	59-50-7	
4-Chloroaniline	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	108-60-1	
2-Chloronaphthalene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	91-58-7	
2-Chlorophenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	7005-72-3	
Chrysene	12800	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	53-70-3	
Dibenzofuran	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	120-83-2	
Diethylphthalate	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	105-67-9	
Dimethylphthalate	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	131-11-3	
Di-n-butylphthalate	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	22900	1	03/22/18 11:24	04/05/18 00:31	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	606-20-2	
Di-n-octylphthalate	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	122-66-7	
bis(2-Ethylhexyl)phthalate	10700	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	117-81-7	
Fluoranthene	25000	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	206-44-0	
Fluorene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	87-68-3	
Hexachlorobenzene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	118-74-1	
Hexachloroethane	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	193-39-5	
Isophorone	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	78-59-1	
1-Methylnaphthalene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	90-12-0	
2-Methylnaphthalene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	8880	1	03/22/18 11:24	04/05/18 00:31		
Naphthalene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	91-20-3	
2-Nitroaniline	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	88-74-4	
3-Nitroaniline	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	99-09-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-F4 (5-10 wm)** Lab ID: **10424443006** Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
4-Nitroaniline	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	100-01-6	
Nitrobenzene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	98-95-3	
2-Nitrophenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	88-75-5	
4-Nitrophenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	86-30-6	
Pentachlorophenol	ND	ug/kg	9020	1	03/22/18 11:24	04/05/18 00:31	87-86-5	
Phenanthrene	14600	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	85-01-8	
Phenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	108-95-2	
Pyrene	25000	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	4440	1	03/22/18 11:24	04/05/18 00:31	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	1	03/22/18 11:24	04/05/18 00:31	4165-60-0	D4,P3, S4
2-Fluorobiphenyl (S)	0	%	30-132	1	03/22/18 11:24	04/05/18 00:31	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	1	03/22/18 11:24	04/05/18 00:31	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	1	03/22/18 11:24	04/05/18 00:31	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	1	03/22/18 11:24	04/05/18 00:31	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	1	03/22/18 11:24	04/05/18 00:31	118-79-6	S4
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	83-32-9	
Acenaphthylene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	208-96-8	
Anthracene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	120-12-7	
Benzo(a)anthracene	5430	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	56-55-3	
Benzo(a)pyrene	2310	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	50-32-8	
Benzo(b)fluoranthene	2470	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	207-08-9	
Chrysene	5470	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	53-70-3	
Fluoranthene	12000	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	206-44-0	
Fluorene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	193-39-5	
Naphthalene	ND	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	91-20-3	
Phenanthrene	3750	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	85-01-8	
Pyrene	11900	ug/kg	1350	10	03/26/18 11:34	03/27/18 20:08	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	10	03/26/18 11:34	03/27/18 20:08	321-60-8	D3,P3, S4
p-Terphenyl-d14 (S)	0	%	57-125	10	03/26/18 11:34	03/27/18 20:08	1718-51-0	S4

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: **FD-WM-F4 (5-10 wm)** Lab ID: **10424443006** Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	25057-89-0	
2,4-D	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	94-75-7	
2,4-DB	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	94-82-6	
Dicamba	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	1918-00-9	
Dinoseb	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	88-85-7	
MCPA	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	94-74-6	
Pentachlorophenol	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	87-86-5	
Picloram	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	1918-02-1	
2,4,5-T	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	93-72-1	
Triclopyr	ND	mg/kg	1.2	10	03/23/18 07:54	03/29/18 18:09	55335-06-3	
Surrogates								
2,4-DCAA (S)	0	%.	46-125	10	03/23/18 07:54	03/29/18 18:09	19719-28-9	D3,S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1460	1	03/26/18 09:03	03/26/18 13:27	67-64-1	
Allyl chloride	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	107-05-1	
Benzene	ND	ug/kg	29.2	1	03/26/18 09:03	03/26/18 13:27	71-43-2	
Bromobenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	108-86-1	
Bromochloromethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	74-97-5	
Bromodichloromethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	75-27-4	
Bromoform	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	75-25-2	
Bromomethane	ND	ug/kg	730	1	03/26/18 09:03	03/26/18 13:27	74-83-9	
2-Butanone (MEK)	ND	ug/kg	365	1	03/26/18 09:03	03/26/18 13:27	78-93-3	
n-Butylbenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	104-51-8	
sec-Butylbenzene	80.4	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	135-98-8	
tert-Butylbenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	98-06-6	
Carbon tetrachloride	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	56-23-5	
Chlorobenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	108-90-7	
Chloroethane	ND	ug/kg	730	1	03/26/18 09:03	03/26/18 13:27	75-00-3	
Chloroform	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	67-66-3	
Chloromethane	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	74-87-3	
2-Chlorotoluene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	95-49-8	
4-Chlorotoluene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	730	1	03/26/18 09:03	03/26/18 13:27	96-12-8	
Dibromochloromethane	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	106-93-4	
Dibromomethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	75-71-8	
1,1-Dichloroethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	75-34-3	
1,2-Dichloroethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	107-06-2	
1,1-Dichloroethene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	156-59-2	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-F4 (5-10 wm) Lab ID: 10424443006 Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	156-60-5	
Dichlorofluoromethane	ND	ug/kg	730	1	03/26/18 09:03	03/26/18 13:27	75-43-4	
1,2-Dichloropropane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	78-87-5	
1,3-Dichloropropane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	142-28-9	
2,2-Dichloropropane	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	594-20-7	
1,1-Dichloropropene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	60-29-7	
Ethylbenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	365	1	03/26/18 09:03	03/26/18 13:27	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	98-82-8	
p-Isopropyltoluene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	99-87-6	
Methylene Chloride	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	365	1	03/26/18 09:03	03/26/18 13:27	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	1634-04-4	
Naphthalene	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	91-20-3	
n-Propylbenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	103-65-1	
Styrene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	79-34-5	N2
Tetrachloroethene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	127-18-4	
Tetrahydrofuran	ND	ug/kg	2920	1	03/26/18 09:03	03/26/18 13:27	109-99-9	
Toluene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	79-00-5	
Trichloroethene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	292	1	03/26/18 09:03	03/26/18 13:27	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	73.0	1	03/26/18 09:03	03/26/18 13:27	108-67-8	
Vinyl chloride	ND	ug/kg	29.2	1	03/26/18 09:03	03/26/18 13:27	75-01-4	
Xylene (Total)	ND	ug/kg	219	1	03/26/18 09:03	03/26/18 13:27	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	03/26/18 09:03	03/26/18 13:27	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	03/26/18 09:03	03/26/18 13:27	2037-26-5	
4-Bromofluorobenzene (S)	94	%	75-125	1	03/26/18 09:03	03/26/18 13:27	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent ND mg/kg 27.2 10 04/02/18 15:00 04/04/18 12:49 18540-29-9 D3

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent **59.7** mg/kg 1.0 1 04/05/18 07:42 16065-83-1

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Sample: FD-WM-F4 (5-10 wm) **Lab ID: 10424443006** Collected: 03/21/18 16:50 Received: 03/21/18 18:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9012 Cyanide, Total								
Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	0.65	1	03/29/18 10:55	03/29/18 13:05	57-12-5	
9056 IC Anions								
Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	0.99	1	03/30/18 14:00	03/31/18 06:02	16984-48-8	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

QC Batch: 139779 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 553598 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/02/18 14:39	N3

METHOD BLANK: 553599 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/02/18 14:46	N3

METHOD BLANK: 553600 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.19	04/02/18 14:52	N3

LABORATORY CONTROL SAMPLE: 553601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	109	105	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553602 553603

Parameter	Units	10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	22.5	480	482	389	390	76	76	65-135	0	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553604 553605

Parameter	Units	10424609001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	1000	932	788	743	79	80	65-135	6	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 529815

Analysis Method: WI MOD GRO

QC Batch Method: EPA 5030 Medium Soil

Analysis Description: WIGRO Solid GCV

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2875655

Matrix: Solid

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	03/30/18 17:39	
a,a,a-Trifluorotoluene (S)	%	100	80-150	03/30/18 17:39	

LABORATORY CONTROL SAMPLE & LCSD: 2875656

2875657

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	46.3	44.7	93	89	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				99	99	80-150			

MATRIX SPIKE SAMPLE:

2876408

Parameter	Units	10424443005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	60.8	115	187	80-120	C0,M1
a,a,a-Trifluorotoluene (S)	%				98	80-150	

SAMPLE DUPLICATE: 2876409

Parameter	Units	10424609003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	104	107	3	20	
a,a,a-Trifluorotoluene (S)	%	99	99	0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 529743

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2875322

Matrix: Solid

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	03/30/18 10:50	

LABORATORY CONTROL SAMPLE: 2875323

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.51	115	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875635 2875636

Parameter	Units	10424609001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Mercury	mg/kg	ND	1.5	1.5	1.5	1.6	110	109	80-120	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

QC Batch: 528915 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2870798 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.8	03/29/18 17:03	
Barium	mg/kg	ND	0.49	03/29/18 17:03	
Boron	mg/kg	ND	7.4	03/29/18 17:03	
Copper	mg/kg	ND	0.49	03/29/18 17:03	
Iron	mg/kg	ND	2.5	03/29/18 17:03	
Manganese	mg/kg	ND	0.25	03/29/18 17:03	
Nickel	mg/kg	ND	0.98	03/29/18 17:03	
Silver	mg/kg	ND	0.49	03/29/18 17:03	
Tin	mg/kg	ND	3.7	03/29/18 17:03	
Titanium	mg/kg	ND	1.2	03/29/18 17:03	
Zinc	mg/kg	ND	0.98	03/29/18 17:03	

LABORATORY CONTROL SAMPLE: 2870799

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	980	929	95	80-120	
Barium	mg/kg	49	49.2	100	80-120	
Boron	mg/kg	49	46.3	94	80-120	
Copper	mg/kg	49	47.6	97	80-120	
Iron	mg/kg	980	964	98	80-120	
Manganese	mg/kg	49	49.0	100	80-120	
Nickel	mg/kg	49	48.2	98	80-120	
Silver	mg/kg	24.5	23.0	94	80-120	
Tin	mg/kg	49	49.7	101	80-120	
Titanium	mg/kg	49	48.8	100	80-120	
Zinc	mg/kg	49	48.1	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870800 2870801

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424443001 Result	Spike Conc.	Spike Conc.	Result							
Aluminum	mg/kg	11900	1370	1380	26800	10300	1090	-120	75-125	89	20	P6,R1
Barium	mg/kg	292	68.3	69	388	431	140	202	75-125	11	20	P6
Boron	mg/kg	26.6	68.3	69	122	132	140	152	75-125	7	20	M1
Copper	mg/kg	228	68.3	69	6980	1110	9880	1280	75-125	145	20	M6,R1
Iron	mg/kg	15900	1370	1380	60900	98200	3290	5960	75-125	47	20	M6,R1
Manganese	mg/kg	249	68.3	69	729	664	703	601	75-125	9	20	P6
Nickel	mg/kg	112	68.3	69	2360	141	3290	41	75-125	177	20	M6,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870800		2870801		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424443001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Silver	mg/kg	1.8	34.2	34.5	34.1	34.9	94	96	75-125	2	20		
Tin	mg/kg	186	68.3	69	237	238	74	76	75-125	1	20	M1	
Titanium	mg/kg	275	68.3	69	265	560	-14	413	75-125	71	20	M1, R1	
Zinc	mg/kg	86700	68.3	69	3680	9550	-121000	-112000	75-125	89	20	M6, R1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 434613

Analysis Method: EPA 6020

QC Batch Method: EPA 3050B

Analysis Description: 6020 MET

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2007430

Matrix: Solid

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	03/31/18 04:29	N2

LABORATORY CONTROL SAMPLE: 2007431

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.6	97	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2007432 2007433

Parameter	Units	2007432		2007433		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424609003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	31.2	4.74	4.74	36.1	22.7	103	-179	75-125	46	20 1M, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528917

Analysis Method: EPA 6020A

QC Batch Method: EPA 3050

Analysis Description: 6020A Solids UPD4

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2870806

Matrix: Solid

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	04/02/18 10:52	
Arsenic	mg/kg	ND	0.50	04/02/18 10:52	
Beryllium	mg/kg	ND	0.20	04/02/18 10:52	
Cadmium	mg/kg	ND	0.079	04/02/18 10:52	
Cobalt	mg/kg	ND	0.50	04/02/18 10:52	
Lead	mg/kg	ND	0.099	04/02/18 10:52	
Lithium	mg/kg	ND	0.50	04/02/18 10:52	
Selenium	mg/kg	ND	0.50	04/02/18 10:52	
Strontium	mg/kg	ND	0.50	04/02/18 10:52	
Vanadium	mg/kg	ND	0.99	04/02/18 10:52	

LABORATORY CONTROL SAMPLE: 2870807

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49.5	51.0	103	80-120	
Arsenic	mg/kg	49.5	50.2	101	80-120	
Beryllium	mg/kg	49.5	50.1	101	80-120	
Cadmium	mg/kg	49.5	51.4	104	80-120	
Cobalt	mg/kg	49.5	52.1	105	80-120	
Lead	mg/kg	49.5	51.3	104	80-120	
Lithium	mg/kg	49.5	50.5	102	80-120	
Selenium	mg/kg	49.5	49.8	101	80-120	
Strontium	mg/kg	49.5	51.6	104	80-120	
Vanadium	mg/kg	49.5	52.6	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870808 2870809

Parameter	Units	10424443001		2870808		2870809		% Rec	% Rec	% Rec	Max	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Antimony	mg/kg	3.0	67	67.7	45.3	52.2	63	73	75-125	14	20	M6
Arsenic	mg/kg	14.3	67	67.7	84.2	84.6	104	104	75-125	1	20	
Beryllium	mg/kg	0.36	67	67.7	67.8	70.7	101	104	75-125	4	20	
Cadmium	mg/kg	4.6	67	67.7	78.7	77.4	110	107	75-125	2	20	
Cobalt	mg/kg	37.4	67	67.7	80.0	109	63	106	75-125	31	20	M6, R1
Lead	mg/kg	724	67	67.7	971	483	368	-356	75-125	67	20	M6, R1
Lithium	mg/kg	6.7	67	67.7	74.4	78.1	101	105	75-125	5	20	
Selenium	mg/kg	0.82	67	67.7	64.9	71.0	96	104	75-125	9	20	
Strontium	mg/kg	106	67	67.7	182	192	114	127	75-125	5	20	M6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2870808		2870809									
Parameter	Units	10424443001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Vanadium	mg/kg	27.4	67	67.7	104	101	114	108	75-125	3	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528973 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2871002 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/26/18 10:56	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/26/18 10:56	
1,1-Dichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
1,1-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,3-Trichloropropane	ug/kg	ND	200	03/26/18 10:56	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/26/18 10:56	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichloropropane	ug/kg	ND	50.0	03/26/18 10:56	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,3-Dichloropropane	ug/kg	ND	50.0	03/26/18 10:56	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
2,2-Dichloropropane	ug/kg	ND	200	03/26/18 10:56	
2-Butanone (MEK)	ug/kg	ND	250	03/26/18 10:56	
2-Chlorotoluene	ug/kg	ND	50.0	03/26/18 10:56	
4-Chlorotoluene	ug/kg	ND	50.0	03/26/18 10:56	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/26/18 10:56	
Acetone	ug/kg	ND	1000	03/26/18 10:56	
Allyl chloride	ug/kg	ND	200	03/26/18 10:56	
Benzene	ug/kg	ND	20.0	03/26/18 10:56	
Bromobenzene	ug/kg	ND	50.0	03/26/18 10:56	
Bromochloromethane	ug/kg	ND	50.0	03/26/18 10:56	
Bromodichloromethane	ug/kg	ND	50.0	03/26/18 10:56	
Bromoform	ug/kg	ND	200	03/26/18 10:56	
Bromomethane	ug/kg	ND	500	03/26/18 10:56	
Carbon tetrachloride	ug/kg	ND	50.0	03/26/18 10:56	
Chlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
Chloroethane	ug/kg	ND	500	03/26/18 10:56	
Chloroform	ug/kg	ND	50.0	03/26/18 10:56	
Chloromethane	ug/kg	ND	200	03/26/18 10:56	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

METHOD BLANK: 2871002

Matrix: Solid

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/26/18 10:56	
Dibromomethane	ug/kg	ND	50.0	03/26/18 10:56	
Dichlorodifluoromethane	ug/kg	ND	200	03/26/18 10:56	
Dichlorofluoromethane	ug/kg	ND	500	03/26/18 10:56	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/26/18 10:56	
Ethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/26/18 10:56	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/26/18 10:56	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/26/18 10:56	
Methylene Chloride	ug/kg	ND	200	03/26/18 10:56	
n-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
n-Propylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Naphthalene	ug/kg	ND	200	03/26/18 10:56	
p-Isopropyltoluene	ug/kg	ND	50.0	03/26/18 10:56	
sec-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Styrene	ug/kg	ND	50.0	03/26/18 10:56	
tert-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Tetrachloroethene	ug/kg	ND	50.0	03/26/18 10:56	
Tetrahydrofuran	ug/kg	ND	2000	03/26/18 10:56	
Toluene	ug/kg	ND	50.0	03/26/18 10:56	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	
Trichloroethene	ug/kg	ND	50.0	03/26/18 10:56	N2
Trichlorofluoromethane	ug/kg	ND	200	03/26/18 10:56	
Vinyl chloride	ug/kg	ND	20.0	03/26/18 10:56	
Xylene (Total)	ug/kg	ND	150	03/26/18 10:56	
1,2-Dichloroethane-d4 (S)	%	90	75-125	03/26/18 10:56	
4-Bromofluorobenzene (S)	%	99	75-125	03/26/18 10:56	
Toluene-d8 (S)	%	98	75-125	03/26/18 10:56	

LABORATORY CONTROL SAMPLE & LCSD: 2871003

2871004

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	828	958	83	96	59-125	15	20	
1,1,1-Trichloroethane	ug/kg	1000	802	933	80	93	59-125	15	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	803	971	80	97	58-125	19	20	N2
1,1,2-Trichloroethane	ug/kg	1000	778	897	78	90	64-125	14	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	776	922	78	92	65-125	17	20	
1,1-Dichloroethane	ug/kg	1000	754	861	75	86	63-125	13	20	
1,1-Dichloroethene	ug/kg	1000	790	968	79	97	59-125	20	20	
1,1-Dichloropropene	ug/kg	1000	799	946	80	95	64-125	17	20	
1,2,3-Trichlorobenzene	ug/kg	1000	776	965	78	97	55-126	22	20	R1
1,2,3-Trichloropropane	ug/kg	1000	736	872	74	87	62-125	17	20	
1,2,4-Trichlorobenzene	ug/kg	1000	804	961	80	96	62-125	18	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

LABORATORY CONTROL SAMPLE & LCSD: 2871003		2871004								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	793	931	79	93	59-125	16	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1890	2200	76	88	54-125	15	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	781	899	78	90	64-125	14	20	
1,2-Dichlorobenzene	ug/kg	1000	765	890	76	89	63-125	15	20	
1,2-Dichloroethane	ug/kg	1000	684	807	68	81	57-125	17	20	
1,2-Dichloropropane	ug/kg	1000	779	896	78	90	67-125	14	20	
1,3,5-Trimethylbenzene	ug/kg	1000	811	936	81	94	59-125	14	20	
1,3-Dichlorobenzene	ug/kg	1000	738	884	74	88	64-125	18	20	
1,3-Dichloropropane	ug/kg	1000	757	878	76	88	64-125	15	20	
1,4-Dichlorobenzene	ug/kg	1000	766	874	77	87	63-125	13	20	
2,2-Dichloropropane	ug/kg	1000	860	973	86	97	37-126	12	20	
2-Butanone (MEK)	ug/kg	5000	3740	4230	75	85	48-125	12	20	
2-Chlorotoluene	ug/kg	1000	777	890	78	89	62-125	13	20	
4-Chlorotoluene	ug/kg	1000	763	893	76	89	63-125	16	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3630	4290	73	86	52-135	17	20	
Acetone	ug/kg	5000	5390	6150	108	123	65-125	13	20	
Allyl chloride	ug/kg	1000	747	873	75	87	52-125	16	20	
Benzene	ug/kg	1000	765	859	76	86	61-125	12	20	
Bromobenzene	ug/kg	1000	794	916	79	92	64-125	14	20	
Bromochloromethane	ug/kg	1000	791	915	79	91	65-125	15	20	
Bromodichloromethane	ug/kg	1000	832	969	83	97	57-125	15	20	
Bromoform	ug/kg	1000	784	903	78	90	57-125	14	20	
Bromomethane	ug/kg	1000	777	845	78	85	60-125	8	20	
Carbon tetrachloride	ug/kg	1000	848	960	85	96	58-125	12	20	
Chlorobenzene	ug/kg	1000	782	883	78	88	66-125	12	20	
Chloroethane	ug/kg	1000	825	870	83	87	62-125	5	20	
Chloroform	ug/kg	1000	701	786	70	79	59-125	11	20	
Chloromethane	ug/kg	1000	733	791	73	79	50-125	8	20	
cis-1,2-Dichloroethene	ug/kg	1000	761	895	76	89	61-125	16	20	
cis-1,3-Dichloropropene	ug/kg	1000	794	937	79	94	61-125	17	20	
Dibromochloromethane	ug/kg	1000	790	890	79	89	60-125	12	20	
Dibromomethane	ug/kg	1000	808	948	81	95	69-125	16	20	
Dichlorodifluoromethane	ug/kg	1000	672	702	67	70	38-125	4	20	
Dichlorofluoromethane	ug/kg	1000	765	803	76	80	67-125	5	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1390	1250	139	125	60-125	11	20 L3	
Ethylbenzene	ug/kg	1000	775	906	78	91	62-125	16	20	
Hexachloro-1,3-butadiene	ug/kg	1000	810	968	81	97	56-125	18	20	
Isopropylbenzene (Cumene)	ug/kg	1000	836	962	84	96	65-125	14	20	
Methyl-tert-butyl ether	ug/kg	1000	731	855	73	86	59-125	16	20	
Methylene Chloride	ug/kg	1000	774	888	77	89	64-125	14	20	
n-Butylbenzene	ug/kg	1000	802	976	80	98	59-125	20	20	
n-Propylbenzene	ug/kg	1000	808	931	81	93	61-125	14	20	
Naphthalene	ug/kg	1000	818	982	82	98	53-125	18	20	
p-Isopropyltoluene	ug/kg	1000	794	949	79	95	63-125	18	20	
sec-Butylbenzene	ug/kg	1000	819	960	82	96	62-125	16	20	
Styrene	ug/kg	1000	816	950	82	95	66-125	15	20	
tert-Butylbenzene	ug/kg	1000	806	939	81	94	64-125	15	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Parameter	Units	2871003		2871004			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Tetrachloroethene	ug/kg	1000	810	941	81	94	67-125	15	20	
Tetrahydrofuran	ug/kg	10000	11200	12700	112	127	62-125	12	20	L3
Toluene	ug/kg	1000	798	905	80	91	61-125	13	20	
trans-1,2-Dichloroethene	ug/kg	1000	807	948	81	95	64-125	16	20	
trans-1,3-Dichloropropene	ug/kg	1000	809	946	81	95	56-125	16	20	
Trichloroethene	ug/kg	1000	767	896	77	90	67-125	15	20	N2
Trichlorofluoromethane	ug/kg	1000	782	818	78	82	65-125	5	20	
Vinyl chloride	ug/kg	1000	805	843	81	84	57-125	5	20	
Xylene (Total)	ug/kg	3000	2420	2790	81	93	62-125	14	20	
1,2-Dichloroethane-d4 (S)	%				91	91	75-125			
4-Bromofluorobenzene (S)	%				101	100	75-125			
Toluene-d8 (S)	%				99	98	75-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528619 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2868814 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/03/18 18:39	
4,4'-DDE	ug/kg	ND	3.3	04/03/18 18:39	
4,4'-DDT	ug/kg	ND	3.3	04/03/18 18:39	
Aldrin	ug/kg	ND	1.7	04/03/18 18:39	
alpha-BHC	ug/kg	ND	1.7	04/03/18 18:39	
alpha-Chlordane	ug/kg	ND	1.7	04/03/18 18:39	
beta-BHC	ug/kg	ND	1.7	04/03/18 18:39	
Chlordane (Technical)	ug/kg	ND	16.7	04/03/18 18:39	
delta-BHC	ug/kg	ND	1.7	04/03/18 18:39	
Dieldrin	ug/kg	ND	3.3	04/03/18 18:39	
Endosulfan I	ug/kg	ND	1.7	04/03/18 18:39	
Endosulfan II	ug/kg	ND	3.3	04/03/18 18:39	
Endosulfan sulfate	ug/kg	ND	3.3	04/03/18 18:39	
Endrin	ug/kg	ND	3.3	04/03/18 18:39	
Endrin aldehyde	ug/kg	ND	3.3	04/03/18 18:39	
Endrin ketone	ug/kg	ND	3.3	04/03/18 18:39	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/03/18 18:39	
gamma-Chlordane	ug/kg	ND	1.7	04/03/18 18:39	
Heptachlor	ug/kg	ND	1.7	04/03/18 18:39	
Heptachlor epoxide	ug/kg	ND	1.7	04/03/18 18:39	
Methoxychlor	ug/kg	ND	16.7	04/03/18 18:39	
Toxaphene	ug/kg	ND	50.0	04/03/18 18:39	
Decachlorobiphenyl (S)	%	92	30-150	04/03/18 18:39	
Tetrachloro-m-xylene (S)	%	92	30-150	04/03/18 18:39	

LABORATORY CONTROL SAMPLE: 2868815

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	31.8	96	62-127	
4,4'-DDE	ug/kg	33.3	30.9	93	66-125	
4,4'-DDT	ug/kg	33.3	32.1	96	67-128	
Aldrin	ug/kg	16.7	14.0	84	66-125	
alpha-BHC	ug/kg	16.7	15.0	90	64-125	
alpha-Chlordane	ug/kg	16.7	14.8	89	68-125	
beta-BHC	ug/kg	16.7	14.8	89	69-125	
delta-BHC	ug/kg	16.7	14.7	88	42-133	
Dieldrin	ug/kg	33.3	32.5	97	69-126	
Endosulfan I	ug/kg	16.7	13.7	82	63-125	
Endosulfan II	ug/kg	33.3	31.7	95	69-125	
Endosulfan sulfate	ug/kg	33.3	29.0	87	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

LABORATORY CONTROL SAMPLE: 2868815

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	30.0	90	69-125	
Endrin aldehyde	ug/kg	33.3	30.3	91	65-125	
Endrin ketone	ug/kg	33.3	32.6	98	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.0	90	67-125	
gamma-Chlordane	ug/kg	16.7	13.3	80	63-125	
Heptachlor	ug/kg	16.7	14.8	89	69-125	
Heptachlor epoxide	ug/kg	16.7	14.9	89	68-125	
Methoxychlor	ug/kg	167	158	95	65-134	
Decachlorobiphenyl (S)	%			88	30-150	
Tetrachloro-m-xylene (S)	%			86	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868816 2868817

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424443005 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	41.9	36.8	36.7	51.6	49.2	26	20	56-125	5	20	M6
4,4'-DDE	ug/kg	ND	36.8	36.7	57.3	45.8	156	125	32-150	22	20	M6,R1
4,4'-DDT	ug/kg	ND	36.8	36.7	47.6	42.7	129	116	60-132	11	20	
Aldrin	ug/kg	ND	18.3	18.3	15.7J	15.8J	85	86	56-125		20	
alpha-BHC	ug/kg	ND	18.3	18.3	18.5	20.4	100	111	54-136	10	20	
alpha-Chlordane	ug/kg	41.9	18.3	18.3	54.2	29.1	67	-69	54-133	60	20	M6,R1
beta-BHC	ug/kg	ND	18.3	18.3	23.2	21.2	126	115	30-150	9	20	
delta-BHC	ug/kg	ND	18.3	18.3	18.3J	18.3J	100	100	45-145		20	
Dieldrin	ug/kg	ND	36.8	36.7	47.4	40.2	129	110	47-150	16	20	
Endosulfan I	ug/kg	ND	18.3	18.3	16.7J	21.4	91	116	35-145		20	
Endosulfan II	ug/kg	ND	36.8	36.7	38.6	37.9	105	103	50-147	2	20	
Endosulfan sulfate	ug/kg	ND	36.8	36.7	36.9	36.9	100	101	54-132	0	20	
Endrin	ug/kg	ND	36.8	36.7	35.9J	33.9J	98	92	62-125		20	
Endrin aldehyde	ug/kg	ND	36.8	36.7	36.2J	36.4J	99	99	33-150		20	
Endrin ketone	ug/kg	106	36.8	36.7	40.1	40.0	-179	-179	56-144	0	20	M6
gamma-BHC (Lindane)	ug/kg	ND	18.3	18.3	21.6	13.5J	117	73	63-125		20	
gamma-Chlordane	ug/kg	23.4	18.3	18.3	34.3	19.7	59	-21	45-132	54	20	M6,R1
Heptachlor	ug/kg	ND	18.3	18.3	18.3J	18.7	100	102	51-142		20	
Heptachlor epoxide	ug/kg	ND	18.3	18.3	18.9	19.3	103	105	50-142	2	20	
Methoxychlor	ug/kg	ND	183	183	202	199	110	109	58-139	1	20	
Decachlorobiphenyl (S)	%						0	0	30-150			S4
Tetrachloro-m-xylene (S)	%						0	0	30-150			7M,D4, S4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528752 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2869601 Matrix: Solid
 Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	03/26/18 09:48	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	03/26/18 09:48	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	03/26/18 09:48	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	03/26/18 09:48	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	03/26/18 09:48	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	03/26/18 09:48	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	03/26/18 09:48	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	03/26/18 09:48	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	03/26/18 09:48	
Decachlorobiphenyl (S)	%	100	30-134	03/26/18 09:48	
Tetrachloro-m-xylene (S)	%	100	48-125	03/26/18 09:48	

LABORATORY CONTROL SAMPLE: 2869602

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	617	93	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	622	93	62-125	
Decachlorobiphenyl (S)	%			101	30-134	
Tetrachloro-m-xylene (S)	%			102	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869603 2869604

Parameter	Units	10424555001		2869603		2869604		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result							
PCB-1016 (Aroclor 1016)	ug/kg	ND	750	749	697	669	93	89	30-150	4	30			
PCB-1260 (Aroclor 1260)	ug/kg	ND	750	749	697	677	93	90	30-138	3	30			
Decachlorobiphenyl (S)	%						102	99	30-134					
Tetrachloro-m-xylene (S)	%						103	99	48-125					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528591 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2868737 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/04/18 18:45	
1,2-Dichlorobenzene	ug/kg	ND	330	04/04/18 18:45	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/04/18 18:45	
1,3-Dichlorobenzene	ug/kg	ND	330	04/04/18 18:45	
1,4-Dichlorobenzene	ug/kg	ND	330	04/04/18 18:45	
1-Methylnaphthalene	ug/kg	ND	330	04/04/18 18:45	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/04/18 18:45	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/04/18 18:45	
2,4-Dichlorophenol	ug/kg	ND	330	04/04/18 18:45	
2,4-Dimethylphenol	ug/kg	ND	330	04/04/18 18:45	
2,4-Dinitrophenol	ug/kg	ND	330	04/04/18 18:45	
2,4-Dinitrotoluene	ug/kg	ND	330	04/04/18 18:45	
2,6-Dinitrotoluene	ug/kg	ND	330	04/04/18 18:45	
2-Chloronaphthalene	ug/kg	ND	330	04/04/18 18:45	
2-Chlorophenol	ug/kg	ND	330	04/04/18 18:45	
2-Methylnaphthalene	ug/kg	ND	330	04/04/18 18:45	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/04/18 18:45	
2-Nitroaniline	ug/kg	ND	330	04/04/18 18:45	
2-Nitrophenol	ug/kg	ND	330	04/04/18 18:45	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/04/18 18:45	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/04/18 18:45	
3-Nitroaniline	ug/kg	ND	330	04/04/18 18:45	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/04/18 18:45	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/04/18 18:45	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/04/18 18:45	
4-Chloroaniline	ug/kg	ND	330	04/04/18 18:45	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/04/18 18:45	
4-Nitroaniline	ug/kg	ND	330	04/04/18 18:45	
4-Nitrophenol	ug/kg	ND	330	04/04/18 18:45	
Acenaphthene	ug/kg	ND	330	04/04/18 18:45	
Acenaphthylene	ug/kg	ND	330	04/04/18 18:45	
Anthracene	ug/kg	ND	330	04/04/18 18:45	
Benzo(a)anthracene	ug/kg	ND	330	04/04/18 18:45	
Benzo(a)pyrene	ug/kg	ND	330	04/04/18 18:45	
Benzo(b)fluoranthene	ug/kg	ND	330	04/04/18 18:45	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/04/18 18:45	
Benzo(k)fluoranthene	ug/kg	ND	330	04/04/18 18:45	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/04/18 18:45	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/04/18 18:45	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/04/18 18:45	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/04/18 18:45	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

METHOD BLANK: 2868737

Matrix: Solid

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/04/18 18:45	
Carbazole	ug/kg	ND	330	04/04/18 18:45	
Chrysene	ug/kg	ND	330	04/04/18 18:45	
Di-n-butylphthalate	ug/kg	ND	330	04/04/18 18:45	
Di-n-octylphthalate	ug/kg	ND	330	04/04/18 18:45	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/04/18 18:45	
Dibenzofuran	ug/kg	ND	330	04/04/18 18:45	
Diethylphthalate	ug/kg	ND	330	04/04/18 18:45	
Dimethylphthalate	ug/kg	ND	330	04/04/18 18:45	
Fluoranthene	ug/kg	ND	330	04/04/18 18:45	
Fluorene	ug/kg	ND	330	04/04/18 18:45	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/04/18 18:45	
Hexachlorobenzene	ug/kg	ND	330	04/04/18 18:45	
Hexachloroethane	ug/kg	ND	330	04/04/18 18:45	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/04/18 18:45	
Isophorone	ug/kg	ND	330	04/04/18 18:45	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/04/18 18:45	
N-Nitrosodimethylamine	ug/kg	ND	330	04/04/18 18:45	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/04/18 18:45	
Naphthalene	ug/kg	ND	330	04/04/18 18:45	
Nitrobenzene	ug/kg	ND	330	04/04/18 18:45	
Pentachlorophenol	ug/kg	ND	670	04/04/18 18:45	
Phenanthrene	ug/kg	ND	330	04/04/18 18:45	
Phenol	ug/kg	ND	330	04/04/18 18:45	
Pyrene	ug/kg	ND	330	04/04/18 18:45	
2,4,6-Tribromophenol (S)	%	84	60-125	04/04/18 18:45	
2-Fluorobiphenyl (S)	%	98	30-132	04/04/18 18:45	
2-Fluorophenol (S)	%	101	40-125	04/04/18 18:45	
Nitrobenzene-d5 (S)	%	90	43-125	04/04/18 18:45	
p-Terphenyl-d14 (S)	%	117	62-125	04/04/18 18:45	
Phenol-d6 (S)	%	99	48-125	04/04/18 18:45	

LABORATORY CONTROL SAMPLE: 2868738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1320	79	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1310	79	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1300	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1320	79	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1310	78	39-125	
1-Methylnaphthalene	ug/kg	1670	1360	82	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1390	84	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1380	83	61-125	
2,4-Dichlorophenol	ug/kg	1670	1360	82	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

LABORATORY CONTROL SAMPLE: 2868738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1230	74	51-125	
2,4-Dinitrophenol	ug/kg	1670	1190	71	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1390	83	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1390	83	63-125	
2-Chloronaphthalene	ug/kg	1670	1380	83	61-125	
2-Chlorophenol	ug/kg	1670	1350	81	46-125	
2-Methylnaphthalene	ug/kg	1670	1370	82	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1270	76	50-125	
2-Nitroaniline	ug/kg	1670	1280	77	61-125	
2-Nitrophenol	ug/kg	1670	1380	83	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1320	79	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1510	90	47-125	
3-Nitroaniline	ug/kg	1670	1350	81	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1380J	83	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1420	85	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1350	81	64-125	
4-Chloroaniline	ug/kg	1670	1230	74	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1380	83	64-125	
4-Nitroaniline	ug/kg	1670	1310	79	59-125	
4-Nitrophenol	ug/kg	1670	1220	73	54-125	
Acenaphthene	ug/kg	1670	1350	81	62-125	
Acenaphthylene	ug/kg	1670	1400	84	61-125	
Anthracene	ug/kg	1670	1450	87	66-125	
Benzo(a)anthracene	ug/kg	1670	1460	88	69-125	
Benzo(a)pyrene	ug/kg	1670	1450	87	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1480	89	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1450	87	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1460	87	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1300	78	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1240	74	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1200	72	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1370	82	69-131	
Butylbenzylphthalate	ug/kg	1670	1410	84	69-129	
Carbazole	ug/kg	1670	1420	85	66-125	
Chrysene	ug/kg	1670	1490	89	68-125	
Di-n-butylphthalate	ug/kg	1670	1370	82	69-125	
Di-n-octylphthalate	ug/kg	1670	1400	84	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1430	86	64-125	
Dibenzofuran	ug/kg	1670	1410	85	65-125	
Diethylphthalate	ug/kg	1670	1370	82	67-125	
Dimethylphthalate	ug/kg	1670	1410	85	67-125	
Fluoranthene	ug/kg	1670	1420	85	66-125	
Fluorene	ug/kg	1670	1390	83	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1280	77	40-125	
Hexachlorobenzene	ug/kg	1670	1400	84	62-125	
Hexachloroethane	ug/kg	1670	1240	74	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1440	87	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

LABORATORY CONTROL SAMPLE: 2868738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1310	79	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1300	78	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1330	80	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1400	84	65-125	
Naphthalene	ug/kg	1670	1360	82	48-125	
Nitrobenzene	ug/kg	1670	1250	75	48-125	
Pentachlorophenol	ug/kg	1670	1180	71	41-125	
Phenanthrene	ug/kg	1670	1450	87	66-125	
Phenol	ug/kg	1670	1350	81	46-125	
Pyrene	ug/kg	1670	1510	90	69-125	
2,4,6-Tribromophenol (S)	%			91	60-125	
2-Fluorobiphenyl (S)	%			95	30-132	
2-Fluorophenol (S)	%			92	40-125	
Nitrobenzene-d5 (S)	%			83	43-125	
p-Terphenyl-d14 (S)	%			103	62-125	
Phenol-d6 (S)	%			91	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868743 2868744

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424443004 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	2420	2420	1530J	1520J	63	63	30-127		30	
1,2-Dichlorobenzene	ug/kg	ND	2420	2420	1330J	1390J	55	58	30-125		30	
1,2-Diphenylhydrazine	ug/kg	ND	2420	2420	1360J	1390J	56	57	30-150		30	
1,3-Dichlorobenzene	ug/kg	ND	2420	2420	1270J	1320J	53	54	30-125		30	
1,4-Dichlorobenzene	ug/kg	ND	2420	2420	1330J	1380J	55	57	30-125		30	
1-Methylnaphthalene	ug/kg	ND	2420	2420	1620J	1690J	60	64	42-125		30	
2,4,5-Trichlorophenol	ug/kg	ND	2420	2420	1770J	1750J	73	72	30-150		30	
2,4,6-Trichlorophenol	ug/kg	ND	2420	2420	1860J	1840J	77	76	30-150		30	
2,4-Dichlorophenol	ug/kg	ND	2420	2420	1680J	1670J	69	69	30-135		30	
2,4-Dimethylphenol	ug/kg	ND	2420	2420	ND	ND	68	67	30-148		30	
2,4-Dinitrophenol	ug/kg	ND	2420	2420	ND	ND	0	0	30-125		30	M1
2,4-Dinitrotoluene	ug/kg	ND	2420	2420	1080J	1230J	44	51	30-150		30	
2,6-Dinitrotoluene	ug/kg	ND	2420	2420	1250J	1280J	52	53	30-150		30	
2-Chloronaphthalene	ug/kg	ND	2420	2420	1580J	1610J	65	67	30-138		30	
2-Chlorophenol	ug/kg	ND	2420	2420	1530J	1550J	63	64	30-130		30	
2-Methylnaphthalene	ug/kg	ND	2420	2420	1610J	1690J	57	61	46-125		30	
2-Methylphenol(o-Cresol)	ug/kg	ND	2420	2420	1470J	1550J	61	64	30-133		30	
2-Nitroaniline	ug/kg	ND	2420	2420	2010J	1930J	83	80	30-150		30	
2-Nitrophenol	ug/kg	ND	2420	2420	989J	941J	41	39	30-134		30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	2420	2420	2280J	2090J	94	86	30-138		30	
3,3'-Dichlorobenzidine	ug/kg	ND	2420	2420	2320J	2510J	96	104	30-149		30	
3-Nitroaniline	ug/kg	ND	2420	2420	2560J	2400J	106	99	30-150		30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	2420	2420	ND	ND	0	0	30-133		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868743												2868744	
Parameter	Units	MS		MSD		MS	MSD	MS	MSD	% Rec	Max	Qual	
		10424443004	Spike	Spike	Result								Result
		Result	Conc.	Conc.	Result	Result				Limits	RPD		
4-Bromophenylphenyl ether	ug/kg	ND	2420	2420	1670J	1640J	69	68	44-125		30		
4-Chloro-3-methylphenol	ug/kg	ND	2420	2420	1760J	1970J	73	81	30-150		30		
4-Chloroaniline	ug/kg	ND	2420	2420	1610J	1800J	66	74	30-125		30		
4-Chlorophenylphenyl ether	ug/kg	ND	2420	2420	1860J	1810J	77	75	44-125		30		
4-Nitroaniline	ug/kg	ND	2420	2420	2270J	2230J	94	92	30-150		30		
4-Nitrophenol	ug/kg	ND	2420	2420	1480J	ND	61	56	30-150		30		
Acenaphthene	ug/kg	ND	2420	2420	1630J	1600J	67	66	40-125		30		
Acenaphthylene	ug/kg	ND	2420	2420	1630J	1630J	67	68	30-150		30		
Anthracene	ug/kg	ND	2420	2420	1690J	1640J	70	68	30-150		30		
Benzo(a)anthracene	ug/kg	ND	2420	2420	1870J	1930J	77	80	30-150		30		
Benzo(a)pyrene	ug/kg	ND	2420	2420	1870J	1940J	77	80	30-150		30		
Benzo(b)fluoranthene	ug/kg	ND	2420	2420	1890J	1960J	78	81	30-150		30		
Benzo(g,h,i)perylene	ug/kg	ND	2420	2420	1890J	1960J	78	81	30-150		30		
Benzo(k)fluoranthene	ug/kg	ND	2420	2420	1740J	1790J	72	74	30-150		30		
bis(2-Chloroethoxy)methane	ug/kg	ND	2420	2420	1450J	1510J	60	63	30-134		30		
bis(2-Chloroethyl) ether	ug/kg	ND	2420	2420	1250J	1250J	52	52	30-125		30		
bis(2-Chloroisopropyl) ether	ug/kg	ND	2420	2420	1280J	1290J	53	53	30-125		30		
bis(2-Ethylhexyl)phthalate	ug/kg	ND	2420	2420	2350J	2990J	97	124	30-150		30		
Butylbenzylphthalate	ug/kg	ND	2420	2420	2090J	2140J	86	89	30-150		30		
Carbazole	ug/kg	ND	2420	2420	1660J	1690J	69	70	41-125		30		
Chrysene	ug/kg	ND	2420	2420	1740J	1760J	72	73	30-150		30		
Di-n-butylphthalate	ug/kg	ND	2420	2420	3200J	3250J	132	134	30-150		30		
Di-n-octylphthalate	ug/kg	ND	2420	2420	1900J	1990J	78	82	30-150		30		
Dibenz(a,h)anthracene	ug/kg	ND	2420	2420	1950J	1910J	80	79	30-150		30		
Dibenzofuran	ug/kg	ND	2420	2420	1710J	1710J	71	71	45-125		30		
Diethylphthalate	ug/kg	ND	2420	2420	1780J	1720J	74	71	30-150		30		
Dimethylphthalate	ug/kg	ND	2420	2420	1740J	1750J	72	72	30-150		30		
Fluoranthene	ug/kg	ND	2420	2420	1850J	1860J	76	77	30-150		30		
Fluorene	ug/kg	ND	2420	2420	1720J	1730J	71	72	30-150		30		
Hexachloro-1,3-butadiene	ug/kg	ND	2420	2420	1410J	1510J	58	63	30-128		30		
Hexachlorobenzene	ug/kg	ND	2420	2420	1700J	1730J	70	72	30-150		30		
Hexachloroethane	ug/kg	ND	2420	2420	ND	ND	29	33	30-125		30	M1	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	2420	2420	1880J	1910J	78	79	30-150		30		
Isophorone	ug/kg	ND	2420	2420	1420J	1470J	59	61	30-140		30		
N-Nitroso-di-n-propylamine	ug/kg	ND	2420	2420	1540J	1640J	64	68	30-147		30		
N-Nitrosodimethylamine	ug/kg	ND	2420	2420	ND	ND	49	48	30-125		30		
N-Nitrosodiphenylamine	ug/kg	ND	2420	2420	1610J	1580J	66	65	30-150		30		
Naphthalene	ug/kg	ND	2420	2420	1480J	1690J	38	47	44-125		30	M1	
Nitrobenzene	ug/kg	ND	2420	2420	1350J	1390J	56	58	30-136		30		
Pentachlorophenol	ug/kg	ND	2420	2420	3430J	3370J	142	139	30-150		30		
Phenanthrene	ug/kg	ND	2420	2420	1780J	1790J	74	74	30-150		30		
Phenol	ug/kg	ND	2420	2420	1510J	1500J	62	62	30-129		30		
Pyrene	ug/kg	ND	2420	2420	1880J	1980J	78	82	30-150		30		
2,4,6-Tribromophenol (S)	%						0	0	60-125			S4	
2-Fluorobiphenyl (S)	%						0	0	30-132			S4	
2-Fluorophenol (S)	%						0	0	40-125			S4	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Parameter	Units	2868743		2868744		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Nitrobenzene-d5 (S)	%.					0	0	43-125		P3, S4
p-Terphenyl-d14 (S)	%.					0	0	62-125		S4
Phenol-d6 (S)	%.					0	0	48-125		S4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

QC Batch: 528955 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2870959 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	03/27/18 13:28	
Acenaphthylene	ug/kg	ND	10.0	03/27/18 13:28	
Anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(a)anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(a)pyrene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(b)fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(k)fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Chrysene	ug/kg	ND	10.0	03/27/18 13:28	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Fluorene	ug/kg	ND	10.0	03/27/18 13:28	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	03/27/18 13:28	
Naphthalene	ug/kg	ND	10.0	03/27/18 13:28	
Phenanthrene	ug/kg	ND	10.0	03/27/18 13:28	
Pyrene	ug/kg	ND	10.0	03/27/18 13:28	
2-Fluorobiphenyl (S)	%	78	42-125	03/27/18 13:28	
p-Terphenyl-d14 (S)	%	87	57-125	03/27/18 13:28	

LABORATORY CONTROL SAMPLE: 2870960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	22.8	68	52-125	
Acenaphthylene	ug/kg	33.3	24.9	75	50-125	
Anthracene	ug/kg	33.3	29.1	87	65-125	
Benzo(a)anthracene	ug/kg	33.3	30.7	92	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.7	92	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.4	94	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	24.5	73	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	27.4	82	67-125	
Chrysene	ug/kg	33.3	28.3	85	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	22.8	68	63-125	
Fluoranthene	ug/kg	33.3	30.9	93	75-125	
Fluorene	ug/kg	33.3	23.1	69	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	23.9	72	63-125	
Naphthalene	ug/kg	33.3	25.1	75	49-125	
Phenanthrene	ug/kg	33.3	23.8	71	65-125	
Pyrene	ug/kg	33.3	29.6	89	64-125	
2-Fluorobiphenyl (S)	%			73	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Parameter	Units	2871138		2871139		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Acenaphthene	ug/kg	ND	34.2	34.2	22.3	22.6	65	66	30-125	1	30
Acenaphthylene	ug/kg	ND	34.2	34.2	23.2	23.2	68	68	30-133	0	30
Anthracene	ug/kg	ND	34.2	34.2	28.2	26.5	83	77	30-150	6	30
Benzo(a)anthracene	ug/kg	ND	34.2	34.2	28.8	28.3	84	83	30-150	2	30
Benzo(a)pyrene	ug/kg	ND	34.2	34.2	29.2	28.1	85	82	30-150	4	30
Benzo(b)fluoranthene	ug/kg	ND	34.2	34.2	27.5	27.1	80	79	30-150	1	30
Benzo(g,h,i)perylene	ug/kg	ND	34.2	34.2	28.6	27.6	84	81	30-150	4	30
Benzo(k)fluoranthene	ug/kg	ND	34.2	34.2	25.8	24.0	75	70	30-150	7	30
Chrysene	ug/kg	ND	34.2	34.2	27.3	26.0	80	76	30-150	5	30
Dibenz(a,h)anthracene	ug/kg	ND	34.2	34.2	23.7	23.3	69	68	30-131	2	30
Fluoranthene	ug/kg	ND	34.2	34.2	28.6	27.7	84	81	30-150	3	30
Fluorene	ug/kg	ND	34.2	34.2	24.0	22.4	70	66	30-147	7	30
Indeno(1,2,3-cd)pyrene	ug/kg	ND	34.2	34.2	26.5	25.3	78	74	30-150	5	30
Naphthalene	ug/kg	ND	34.2	34.2	21.6	22.6	63	66	30-131	4	30
Phenanthrene	ug/kg	ND	34.2	34.2	23.6	22.8	69	67	30-150	3	30
Pyrene	ug/kg	ND	34.2	34.2	28.6	27.3	84	80	30-150	5	30
2-Fluorobiphenyl (S)	%.						66	65	42-125		
p-Terphenyl-d14 (S)	%.						82	81	57-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

QC Batch: 528725 Analysis Method: EPA 8270D
QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2869530 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	03/29/18 15:27	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	03/29/18 15:27	
2,4-D	mg/kg	ND	0.033	03/29/18 15:27	
2,4-DB	mg/kg	ND	0.033	03/29/18 15:27	
Bentazon	mg/kg	ND	0.033	03/29/18 15:27	
Dicamba	mg/kg	ND	0.033	03/29/18 15:27	
Dinoseb	mg/kg	ND	0.033	03/29/18 15:27	
MCPA	mg/kg	ND	0.033	03/29/18 15:27	
Pentachlorophenol	mg/kg	ND	0.033	03/29/18 15:27	
Picloram	mg/kg	ND	0.033	03/29/18 15:27	
Triclopyr	mg/kg	ND	0.033	03/29/18 15:27	
2,4-DCAA (S)	%	81	46-125	03/29/18 15:27	

LABORATORY CONTROL SAMPLE: 2869531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.27	81	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	77	61-125	
2,4-D	mg/kg	.33	0.28	83	63-125	
2,4-DB	mg/kg	.33	0.26	79	59-125	
Bentazon	mg/kg	.33	0.24	73	58-125	
Dicamba	mg/kg	.33	0.26	78	52-125	
Dinoseb	mg/kg	.33	0.23	68	35-126	
MCPA	mg/kg	.33	0.26	78	57-125	
Pentachlorophenol	mg/kg	.33	0.27	81	48-125	
Picloram	mg/kg	.33	0.22	65	47-125	
Triclopyr	mg/kg	.33	0.27	80	68-125	
2,4-DCAA (S)	%			87	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869532 2869533

Parameter	Units	10424249001		2869533		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
2,4,5-T	mg/kg	ND	.97	.97	0.49	.42J	50	43	30-145	20	
2,4,5-TP (Silvex)	mg/kg	ND	.97	.97	0.69	0.57	70	58	30-130	19	20
2,4-D	mg/kg	ND	.97	.97	1.7	.3J	176	31	30-150	20	M1
2,4-DB	mg/kg	ND	.97	.97	0.69	0.60	71	61	45-126	15	20
Bentazon	mg/kg	ND	.97	.97	0.87	0.66	89	67	30-133	28	20 R1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869532		2869533		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dicamba	mg/kg	ND	.97	.97	.42J	.36J	43	37	30-140		20		
Dinoseb	mg/kg	ND	.97	.97	0.91	0.82	93	84	30-136	10	20		
MCPA	mg/kg	ND	.97	.97	0.55	0.55	56	57	30-136	0	20		
Pentachlorophenol	mg/kg	ND	.97	.97	0.63	0.70	64	71	44-125	11	20		
Picloram	mg/kg	ND	.97	.97	ND	ND	0	0	30-125		20	M1	
Triclopyr	mg/kg	ND	.97	.97	0.59	0.52	60	54	30-149	12	20		
2,4-DCAA (S)	%						78	68	46-125				D3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 528667 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 2869187 Matrix: Solid

Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/23/18 08:55	
n-Triacontane (S)	%.	81	50-150	03/23/18 08:55	

LABORATORY CONTROL SAMPLE & LCSD: 2869188 2869189

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	71.6	68.4	89	86	70-120	4	20	
n-Triacontane (S)	%.				90	91	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

QC Batch: 434844 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005

METHOD BLANK: 2008420 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/03/18 11:09	

LABORATORY CONTROL SAMPLE: 2008421

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1090	929	85	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008432 2008433

Parameter	Units	50193104001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	2190	2230	ND	ND	0	0	75-125		20	3M, M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008434 2008435

Parameter	Units	50193104001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	79.1	80.9	4.7J	6.3J	2	4	75-125		20	M3

SAMPLE DUPLICATE: 2008431

Parameter	Units	469837006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

QC Batch: 435086 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10424443006

METHOD BLANK: 2009757 Matrix: Solid
Associated Lab Samples: 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/04/18 12:49	

LABORATORY CONTROL SAMPLE: 2009758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	981	901	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009842 2009843

Parameter	Units	10424937001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	1420	1360	ND	ND	0	0	75-125	20	2M, M3	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009844 2009845

Parameter	Units	10424937001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	54.8	54.3	ND	ND	12	18	75-125	20	M3	

SAMPLE DUPLICATE: 2009846

Parameter	Units	50193299003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 284583 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 1665486 Matrix: Solid
 Associated Lab Samples: 10424443001, 10424443002, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	03/29/18 12:56	

LABORATORY CONTROL SAMPLE: 1665487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665488 1665489

Parameter	Units	10424609003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	ND	3.62	3.62	2.8	3.2	66	77	80-120	13	20	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665490 1665491

Parameter	Units	10424937006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.56	4.11	4.26	4.2	4.0	89	81	80-120	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

QC Batch: 139650 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10424443002

METHOD BLANK: 553027 Matrix: Solid
Associated Lab Samples: 10424443002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/02/18 14:06	

LABORATORY CONTROL SAMPLE: 553026

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50	51.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553028 553029

Parameter	Units	12106345001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	2.6	50.2	49.5	39.2	45.6	73	87	80-120	15	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553030 553031

Parameter	Units	12106346001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	2.9	50.2	49.3	50.6	47.0	95	90	80-120	7	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

QC Batch: 139654 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10424443001, 10424443003, 10424443004, 10424443005, 10424443006

METHOD BLANK: 553043 Matrix: Solid
Associated Lab Samples: 10424443001, 10424443003, 10424443004, 10424443005, 10424443006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.98	03/31/18 00:49	

LABORATORY CONTROL SAMPLE: 553042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	48.9	50.2	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553044 553045

Parameter	Units	10424443004 Result	553044		553045		% Rec	% Rec	% Rec	Limits	Max		Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					RPD	RPD	
Fluoride	mg/kg	2.9	50.3	50.2	28.2	28.6	50	51	80-120	1	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553046 553047

Parameter	Units	10424937003 Result	553046		553047		% Rec	% Rec	% Rec	Limits	Max		Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					RPD	RPD	
Fluoride	mg/kg	3.5	49.3	49	14.1	15.9	21	25	80-120	12	20	M1	

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10424443

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 529212

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.

2M Redox (174 mv) and pH (8.13) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.

3M Redox (25 mv) and pH (7.84) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

ANALYTE QUALIFIERS

4M	Sample was black in color and slightly viscous. Sample needed to be centrifuged and decanted prior to analysis.
5M	Sample was black in color and very viscous and grainy. Sample needed to be centrifuged and decanted prior to analysis.
6M	Sample was black in color. Sample needed to be centrifuged and decanted prior to analysis.
7M	Sample was dark brown in color.
C0	Result confirmed by second analysis.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D4	Sample was diluted due to the presence of high levels of target analytes.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
T6	High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424443002	FD-WM-D5 (5-16 wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424443003	FD-WM-E5 (5-10 wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424443004	FD-WM-F5 (3-11 wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424443005	FD-WM-G5 (5-14 wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424443006	FD-WM-F4 (5-10 wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3550	528619	EPA 8081B	530202
10424443002	FD-WM-D5 (5-16 wm)	EPA 3550	528619	EPA 8081B	530202
10424443003	FD-WM-E5 (5-10 wm)	EPA 3550	528619	EPA 8081B	530202
10424443004	FD-WM-F5 (3-11 wm)	EPA 3550	528619	EPA 8081B	530202
10424443005	FD-WM-G5 (5-14 wm)	EPA 3550	528619	EPA 8081B	530202
10424443006	FD-WM-F4 (5-10 wm)	EPA 3550	528619	EPA 8081B	530202
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3550	528752	EPA 8082A	528963
10424443002	FD-WM-D5 (5-16 wm)	EPA 3550	528752	EPA 8082A	528963
10424443003	FD-WM-E5 (5-10 wm)	EPA 3550	528752	EPA 8082A	528963
10424443004	FD-WM-F5 (3-11 wm)	EPA 3550	528752	EPA 8082A	528963
10424443005	FD-WM-G5 (5-14 wm)	EPA 3550	528752	EPA 8082A	528963
10424443006	FD-WM-F4 (5-10 wm)	EPA 3550	528752	EPA 8082A	528963
10424443001	FD-WM-C5 (15-17.5 wm)	WI MOD DRO	528667	WI MOD DRO	528730
10424443002	FD-WM-D5 (5-16 wm)	WI MOD DRO	528667	WI MOD DRO	528730
10424443003	FD-WM-E5 (5-10 wm)	WI MOD DRO	528667	WI MOD DRO	528730
10424443004	FD-WM-F5 (3-11 wm)	WI MOD DRO	528667	WI MOD DRO	528730
10424443005	FD-WM-G5 (5-14 wm)	WI MOD DRO	528667	WI MOD DRO	528730
10424443006	FD-WM-F4 (5-10 wm)	WI MOD DRO	528667	WI MOD DRO	528730
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424443002	FD-WM-D5 (5-16 wm)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424443003	FD-WM-E5 (5-10 wm)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424443004	FD-WM-F5 (3-11 wm)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424443005	FD-WM-G5 (5-14 wm)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424443006	FD-WM-F4 (5-10 wm)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3050	528915	EPA 6010C	528992
10424443002	FD-WM-D5 (5-16 wm)	EPA 3050	528915	EPA 6010C	528992
10424443003	FD-WM-E5 (5-10 wm)	EPA 3050	528915	EPA 6010C	528992
10424443004	FD-WM-F5 (3-11 wm)	EPA 3050	528915	EPA 6010C	528992
10424443005	FD-WM-G5 (5-14 wm)	EPA 3050	528915	EPA 6010C	528992
10424443006	FD-WM-F4 (5-10 wm)	EPA 3050	528915	EPA 6010C	528992
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3050B	434613	EPA 6020	434971
10424443002	FD-WM-D5 (5-16 wm)	EPA 3050B	434613	EPA 6020	434971
10424443003	FD-WM-E5 (5-10 wm)	EPA 3050B	434613	EPA 6020	434971
10424443004	FD-WM-F5 (3-11 wm)	EPA 3050B	434613	EPA 6020	434971
10424443005	FD-WM-G5 (5-14 wm)	EPA 3050B	434613	EPA 6020	434971
10424443006	FD-WM-F4 (5-10 wm)	EPA 3050B	434613	EPA 6020	434971
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3050	528917	EPA 6020A	529111
10424443002	FD-WM-D5 (5-16 wm)	EPA 3050	528917	EPA 6020A	529111
10424443003	FD-WM-E5 (5-10 wm)	EPA 3050	528917	EPA 6020A	529111

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soils

Pace Project No.: 10424443

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424443004	FD-WM-F5 (3-11 wm)	EPA 3050	528917	EPA 6020A	529111
10424443005	FD-WM-G5 (5-14 wm)	EPA 3050	528917	EPA 6020A	529111
10424443006	FD-WM-F4 (5-10 wm)	EPA 3050	528917	EPA 6020A	529111
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 7471	529743	EPA 7471	529845
10424443002	FD-WM-D5 (5-16 wm)	EPA 7471	529743	EPA 7471	529845
10424443003	FD-WM-E5 (5-10 wm)	EPA 7471	529743	EPA 7471	529845
10424443004	FD-WM-F5 (3-11 wm)	EPA 7471	529743	EPA 7471	529845
10424443005	FD-WM-G5 (5-14 wm)	EPA 7471	529743	EPA 7471	529845
10424443006	FD-WM-F4 (5-10 wm)	EPA 7471	529743	EPA 7471	529845
10424443001	FD-WM-C5 (15-17.5 wm)	ASTM D2974	528579		
10424443002	FD-WM-D5 (5-16 wm)	ASTM D2974	528579		
10424443003	FD-WM-E5 (5-10 wm)	ASTM D2974	528579		
10424443004	FD-WM-F5 (3-11 wm)	ASTM D2974	528579		
10424443005	FD-WM-G5 (5-14 wm)	ASTM D2974	528579		
10424443006	FD-WM-F4 (5-10 wm)	ASTM D2974	528579		
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3550	528591	EPA 8270D	530714
10424443002	FD-WM-D5 (5-16 wm)	EPA 3550	528591	EPA 8270D	530714
10424443003	FD-WM-E5 (5-10 wm)	EPA 3550	528591	EPA 8270D	530714
10424443004	FD-WM-F5 (3-11 wm)	EPA 3550	528591	EPA 8270D	530714
10424443005	FD-WM-G5 (5-14 wm)	EPA 3550	528591	EPA 8270D	530714
10424443006	FD-WM-F4 (5-10 wm)	EPA 3550	528591	EPA 8270D	530714
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3550	528955	EPA 8270D by SIM	529226
10424443002	FD-WM-D5 (5-16 wm)	EPA 3550	528955	EPA 8270D by SIM	529226
10424443003	FD-WM-E5 (5-10 wm)	EPA 3550	528955	EPA 8270D by SIM	529226
10424443004	FD-WM-F5 (3-11 wm)	EPA 3550	528955	EPA 8270D by SIM	529226
10424443005	FD-WM-G5 (5-14 wm)	EPA 3550	528955	EPA 8270D by SIM	529226
10424443006	FD-WM-F4 (5-10 wm)	EPA 3550	528955	EPA 8270D by SIM	529226
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3546	528725	EPA 8270D	529735
10424443002	FD-WM-D5 (5-16 wm)	EPA 3546	528725	EPA 8270D	529735
10424443003	FD-WM-E5 (5-10 wm)	EPA 3546	528725	EPA 8270D	529735
10424443004	FD-WM-F5 (3-11 wm)	EPA 3546	528725	EPA 8270D	529735
10424443005	FD-WM-G5 (5-14 wm)	EPA 3546	528725	EPA 8270D	529735
10424443006	FD-WM-F4 (5-10 wm)	EPA 3546	528725	EPA 8270D	529735
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 5035/5030B	528973	EPA 8260B	529212
10424443002	FD-WM-D5 (5-16 wm)	EPA 5035/5030B	528973	EPA 8260B	529212
10424443003	FD-WM-E5 (5-10 wm)	EPA 5035/5030B	528973	EPA 8260B	529212
10424443004	FD-WM-F5 (3-11 wm)	EPA 5035/5030B	528973	EPA 8260B	529212
10424443005	FD-WM-G5 (5-14 wm)	EPA 5035/5030B	528973	EPA 8260B	529212
10424443006	FD-WM-F4 (5-10 wm)	EPA 5035/5030B	528973	EPA 8260B	529212
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 3060A	434844	EPA 7196A	435162
10424443002	FD-WM-D5 (5-16 wm)	EPA 3060A	434844	EPA 7196A	435162
10424443003	FD-WM-E5 (5-10 wm)	EPA 3060A	434844	EPA 7196A	435162
10424443004	FD-WM-F5 (3-11 wm)	EPA 3060A	434844	EPA 7196A	435162
10424443005	FD-WM-G5 (5-14 wm)	EPA 3060A	434844	EPA 7196A	435162
10424443006	FD-WM-F4 (5-10 wm)	EPA 3060A	435086	EPA 7196A	435521

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soils
Pace Project No.: 10424443

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424443001	FD-WM-C5 (15-17.5 wm)	Trivalent Chromium Calculation	435702		
10424443002	FD-WM-D5 (5-16 wm)	Trivalent Chromium Calculation	435702		
10424443003	FD-WM-E5 (5-10 wm)	Trivalent Chromium Calculation	435702		
10424443004	FD-WM-F5 (3-11 wm)	Trivalent Chromium Calculation	435702		
10424443005	FD-WM-G5 (5-14 wm)	Trivalent Chromium Calculation	435702		
10424443006	FD-WM-F4 (5-10 wm)	Trivalent Chromium Calculation	435702		
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 9012A	284583	EPA 9012	284661
10424443002	FD-WM-D5 (5-16 wm)	EPA 9012A	284583	EPA 9012	284661
10424443003	FD-WM-E5 (5-10 wm)	EPA 9012A	284583	EPA 9012	284661
10424443004	FD-WM-F5 (3-11 wm)	EPA 9012A	284583	EPA 9012	284661
10424443005	FD-WM-G5 (5-14 wm)	EPA 9012A	284583	EPA 9012	284661
10424443006	FD-WM-F4 (5-10 wm)	EPA 9012A	284583	EPA 9012	284661
10424443001	FD-WM-C5 (15-17.5 wm)	EPA 300.0	139654	EPA 9056A	139672
10424443002	FD-WM-D5 (5-16 wm)	EPA 300.0	139650	EPA 9056A	139673
10424443003	FD-WM-E5 (5-10 wm)	EPA 300.0	139654	EPA 9056A	139672
10424443004	FD-WM-F5 (3-11 wm)	EPA 300.0	139654	EPA 9056A	139672
10424443005	FD-WM-G5 (5-14 wm)	EPA 300.0	139654	EPA 9056A	139672
10424443006	FD-WM-F4 (5-10 wm)	EPA 300.0	139654	EPA 9056A	139672

REPORT OF LABORATORY ANALYSIS

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WO# 10424443



10424443



Chain-of-Custody Form

Work Order Number: COC

Turnaround Time: COC ID:

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: **MPCA Freeborn LF Soils** Program Code (MDH Lab Only):
 Project Name: **MPCA Freeborn LF Soils** Project Task Code:
 Project Manager:
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name:
 Address: **18-00583**
GPIL Profile # 38716
 Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wt-Ground=Groundwater
 Wt-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	RESERV.	Lab Sample No.	#
FD-WM-C5 (15-17.5m)	S	3/21/18	1005	15'	17.5'	C	SD	WM			13	X			1
FD-WM-B5 (3-16m)	S	3/21/18	1145	3'	16'	C	SD	WM			12	X			2
FD-WM-E5 (5-10m)	S	3/21/18	1300	5'	10'	C	SD	WM			13	X	X		3
FD-WM-F5 (3-11m)	S	3/21/18	1530	3'	11'	C	SD	WM			13	X			4
FD-WM-G5 (5-14m)	S	3/21/18	1620	5'	14'	C	SD	WM			13	X	X		5
FD-WM-F4 (5-10m)	S	3/21/18	1650	5'	10'	C	SD	WM			13	X			6
															7
															8
															9
															10

See attached for soils (most - dioxins)

+ Dioxins

001
002
003
004
005
006

Sampled By: **Chris Pelosi**

Sampler's Signature: *Chris Pelosi*

Phone #: **612-597-7254**

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<i>Chris Pelosi</i> Pace	3/21/18 1811	<i>Mary Vind Pace</i>	3/21/18 1812

F=6.7, 9.4, 9.3, 7.1, 9.0°C

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluorine, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCS	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.



Document Name:
Sample Condition Upon Receipt Form

Document No.:
F-MN-L-213-rev.22

Document Revised: 14Dec2017
Page 1 of 2

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace Field

Project #: **WO# : 10424443**

PM: BM2 Due Date: 04/05/18

CLIENT: PACE-MNFIELD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: FB Temp Blank? Yes No

Thermometer Used: 151401163 6.9, 9.1, 9.2, 6.9 G87A9155100842 5.8 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): _____ Cooler Temp Corrected (°C): 6.7, 9.4, 9.3, 7.1, 9.0 Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: 3/21/18

USDA Regulated Soil (including water sample) Yes No N/A

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No N/A

Did samples originate from a foreign source (including Hawaii and Puerto Rico)? Yes No N/A

If Yes to either question, fill out a Regulated Soil Checklist (Form Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: BA VC Date: 3/22/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

40166402
Pace Analytical
 www.pacelabs.com
 Page 1 of 97

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN


Workorder: 10424443 Workorder Name: 18-00383 MPCA Freeway LF Soils Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To		Subcontract To						Requested Analysis																	
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436						Cvanide by EPA 9012																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Preserved Containers													LAB USE ONLY					
1	FD-WM-C5 (15-17.5 wm) <i>001</i>	PS	3/21/2018 10:05	10424443001	Solid	1																			
2	FD-WM-D5 (5-16 wm) <i>002</i>	PS	3/21/2018 11:45	10424443002	Solid	1																			
3	FD-WM-E5 (5-10 wm) <i>003</i>	PS	3/21/2018 13:00	10424443003	Solid	1																			
4	FD-WM-F5 (3-11 wm) <i>004</i>	PS	3/21/2018 15:30	10424443004	Solid	1																			
5	FD-WM-G5 (5-14 wm) <i>005</i>	PS	3/21/2018 16:20	10424443005	Solid	1																			
6	FD-WM-F4 (5-10 wm) <i>006</i>	PS	3/21/2018 16:50	10424443006	Solid	1																			

Transfers						Comments											
Released By	Date/Time	Received By	Date/Time														
<i>Lang Kirk Pace</i>	<i>3/23/18 1730</i>	<i>[Signature]</i>															
<i>Walter</i>	<i>3/24/18 0805</i>	<i>[Signature]</i>	<i>3/24/18 0805</i>														

Cooler Temperature on Receipt *2* °C Custody Seal *(Y)* or N Received on Ice *(Y)* or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN Project #: _____
Courier: CS Logistics Fed Ex Speedee UPS Waitco
 Client Pace Other: _____

WO#: 40166402



40166402

Tracking #: 1674908-1
Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used SR - 75 **Type of Ice:** Wet Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature Uncorr: 2 / Corr: 2

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no
 Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Person examining contents:
 Date: 3/24/18
 Initials: SSh

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>DRWO</u> <u>SSh 3/24/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		<u>005 - client collect time "1610"</u> <u>006 - no client collect time SSh 3/24/18</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: Ue Date: 3/26/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424443 Workorder Name: 18-00383 MPCA Freeway LF Soils Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To		Subcontract To					Requested Analysis																						
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100																											
							Preserved Containers																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																							
																											5019 3165 LAB USE ONLY		
1	FD-WM-C5 (15-17.5 wm)	PS	3/21/2018 10:05	10424443001	Solid	1																						001	
2	FD-WM-D5 (5-16 wm)	PS	3/21/2018 11:45	10424443002	Solid	1																							002
3	FD-WM-E5 (5-10 wm)	PS	3/21/2018 13:00	10424443003	Solid	1																							003
4	FD-WM-F5 (3-11 wm)	PS	3/21/2018 15:30	10424443004	Solid	1																							004
5	FD-WM-G5 (5-14 wm)	PS	3/21/2018 16:20	10424443005	Solid	1																							005
6	FD-WM-F4 (5-10 wm)	PS	3/21/2018 16:50	10424443006	Solid	1																							006
																						Comments							
Transfers	Released By	Date/Time	Received By	Date/Time																									
1	[Signature]	3/21/18	[Signature] FED EX																										
2	[Signature]		[Signature]	3/23/18 0910																									
3																													
Cooler Temperature on Receipt		1.0 °C	Custody Seal		(Y) or N	Received on Ice		(Y) or N	Samples Intact			(Y) or N																	

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193165

Date/Time and Initials of person examining contents: 3/28/18 1415 DJ

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7405

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 023456ABCDEF **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 0.8/1.0 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)			All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:			Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:			Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)?: Analysis:			Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			
Rush TAT Requested:			Headspace in VOA Vials (>6mm):			
Containers Intact?:			Trip Blank Present?:			
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:			

Comments:

Sample Container Count

WO#: 50193165



CLIENT: Pace MN

COC PAGE 1 of 1

COC ID# _____

Project # 5093165

SBS
DI
Bulk
Kit

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix (Soil/W Aqueous)	pH <2	pH >9	pH >12
1								1											Soil			
2								1														
3								1														
4								1														
5								1														
6								1														
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VGSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VGGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
VGGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
VG3G	4oz unpreserved amber wide	BG3H	250mL HCL Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Chain of Custody

PM: HRZ Due Date: 04/05/18
 CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424443 Workorder Name: 18-00383 MPCA Freeway LF Soils Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To		Subcontract To				Requested Analysis													
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380				Methyl Mercury EPA 1630													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers						LAB USE ONLY							
						Unpreserved													
1	FD-WM-C5 (15-17.5 wm)	PS	3/21/2018 10:05	10424443001	Solid	1													
2	FD-WM-D5 (5-16 wm)	PS	3/21/2018 11:45	10424443002	Solid	1													
3	FD-WM-E5 (5-10 wm)	PS	3/21/2018 13:00	10424443003	Solid	1													
4	FD-WM-F5 (3-11 wm)	PS	3/21/2018 15:30	10424443004	Solid	1													
5	FD-WM-G5 (5-14 wm)	PS	3/21/2018 16:20	10424443005	Solid	1													
6	FD-WM-F4 (5-10 wm)	PS	3/21/2018 16:50	10424443006	Solid	1													
Transfers												Comments							
Released By	Date/Time	Received By	Date/Time																
<i>Long Vub PACE</i>	<i>3/21/18 1810</i>	<i>RJ Chapp</i>	<i>3-22-18 1915</i>																
<i>RJ Chapp</i>	<i>3-22-18 2100</i>	<i>RJ Chapp</i>	<i>3/23/18 0800</i>																
3																			
Cooler Temperature on Receipt <i>3.4 °C</i>		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N													

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Chain of Custody

WO#: 12106226



12106226

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

Workorder: 10424443 Workorder Name: 18-00383 MPCA Freeway LF Soils Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To		Subcontract To				Requested Analysis																														
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				<div style="display: flex; justify-content: space-between;"> Fluoride by 9056 LAB USE ONLY </div>																														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													Preserved Containers																		
																		Unpreserved																		
1	FD-WM-C5 (15-17.5 wm)	PS	3/21/2018 10:05	10424443001	Solid													1																		
2	FD-WM-D5 (5-16 wm)	PS	3/21/2018 11:45	10424443002	Solid													1																		
3	FD-WM-E5 (5-10 wm)	PS	3/21/2018 13:00	10424443003	Solid													1																		
4	FD-WM-F5 (3-11 wm)	PS	3/21/2018 15:30	10424443004	Solid													1																		
5	FD-WM-G5 (5-14 wm)	PS	3/21/2018 16:20	10424443005	Solid	1																														
6	FD-WM-F4 (5-10 wm)	PS	3/21/2018 16:50	10424443006	Solid	1																														
Transfers												Comments																								
Released By	Date/Time	Received By	Date/Time																																	
<i>kyj</i>	<i>3/21/18 1800</i>	<i>CB</i>	<i>3/27/18 1845</i>																																	
<i>CB</i>	<i>3/27/18 2230</i>	<i>[Signature]</i>	<i>3/28/18 1110</i>																																	
Cooler Temperature on Receipt <i>4.0</i> °C				Custody Seal <input checked="" type="radio"/> or N				Received on Ice <input checked="" type="radio"/> or N				Samples Intact <input checked="" type="radio"/> or N																								

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace - MPLS.

Project #:

WO# : 12106226
 PM: HRZ Due Date: 04/05/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 3/27/18 CJS
 Comments: all 3/28/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Heather Eto

Date: 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 12106226

Chain of Custody

PM: HRZ Due Date: 04/05/18
CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424443 Workorder Name: 18-00383 MPCA Freeway LF Soils Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To Subcontract To Requested Analysis

Bob Michels
Pace Analytical Minnesota
1700 Elm Street
Suite 200
Minneapolis, MN 55414
Phone (612)607-6452

Pace Analytical Duluth
4730 Oneota St.
Duluth, MN 55807
Phone (218)727-6380

WO#: 10424443



Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Methyl Mercury EPA 1631	LAB USE ONLY
						Unpreserved					
1	FD-WM-C5 (15-17.5 wm)	PS	3/21/2018 10:05	10424443001	Solid	1				X	
2	FD-WM-D5 (5-16 wm)	PS	3/21/2018 11:45	10424443002	Solid	1				X	
3	FD-WM-E5 (5-10 wm)	PS	3/21/2018 13:00	10424443003	Solid	1				X	
4	FD-WM-F5 (3-11 wm)	PS	3/21/2018 15:30	10424443004	Solid	1				X	
5	FD-WM-G5 (5-14 wm)	PS	3/21/2018 16:20	10424443005	Solid	1				X	
6	FD-WM-F4 (5-10 wm)	PS	3/21/2018 16:50	10424443006	Solid	1				X	

Comments

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>Long Jack PACE</i>	<i>3/22/18 1810</i>	<i>DJ Chapp</i>	<i>3-22-18 1915</i>	
2	<i>DJ Chapp</i>	<i>3-22-18 2100</i>	<i>K. Hagg</i>	<i>3/23/18 0800</i>	
3	<i>DJ Chapp</i>	<i>3/28/18 1900</i>	<i>Long Jack PACE</i>	<i>3/28/18 1900</i>	<i>T = 4.3°C, CUSTODY SEALED, ON ICE, & INTACT</i>

Cooler Temperature on Receipt *3.4 °C* Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

*Returning sample -002
K. Hagg 3/28/18*

Sample Condition Upon Receipt

Client Name: 3/28/18 SD
Pace-Duluth MPLS Project #: _____

WO#: 10424443
PM: BM2 Due Date: 04/05/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842
Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 4.1 Cooler Temp Corrected (°C): 4.3 Biological Tissue Frozen? Yes No N/A
Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: BT 3/28/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. ORIGINAL REQUEST FOR 4/5/18 BUT PACE DULUTH SENT SAMPLE RETURN TO US.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. SAMPLE 002 RETURNED FROM WO: 1042443 TO US.
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased): _____	15.

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
Comments/Resolution: _____

Project Manager Review: _____

Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

May 03, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 22, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on May 3, 2018 to exlude results for magnesium and include results for manganese by method 6010.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424609001	FD-SB-A4 (26-32.5)	Solid	03/22/18 11:25	03/22/18 17:40
10424609002	FD-SB-B4-WM (3-20 WM)	Solid	03/22/18 13:20	03/22/18 17:40
10424609003	FD-SB-C4-WM (5-20 WM)	Solid	03/22/18 15:00	03/22/18 17:40
10424609004	FD-SB-D4-WM (5-20)	Solid	03/22/18 15:50	03/22/18 17:40
10424609005	FD-SB-E4-WM (3-21)	Solid	03/22/18 16:30	03/22/18 17:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10424609001	FD-SB-A4 (26-32.5)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	LPM	2	PASI-M		
		EPA 6010C	IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	PW1	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	JRH	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8270D	STB	12	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10424609002	FD-SB-B4-WM (3-20 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	LPM			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	PW1			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	JRH			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8270D	STB			12	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10424609003	FD-SB-C4-WM (5-20 WM)			EPA 1630 (1998)	CPK	1	PASI-DUL

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JLR	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424609004	FD-SB-D4-WM (5-20)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JLR	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424609005	FD-SB-E4-WM (3-21)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	LPM	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JLR	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-A4 (26-32.5)** Lab ID: **10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	26.3	1	03/30/18 11:35	04/02/18 15:06	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	309-00-2	
alpha-BHC	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	319-84-6	
beta-BHC	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	319-85-7	
delta-BHC	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	58-89-9	
Chlordane (Technical)	ND	ug/kg	51.4	1	03/26/18 07:27	04/04/18 00:45	57-74-9	
alpha-Chlordane	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	5103-71-9	
gamma-Chlordane	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	5103-74-2	
4,4'-DDD	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	72-54-8	
4,4'-DDE	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	72-55-9	
4,4'-DDT	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	50-29-3	
Dieldrin	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	60-57-1	
Endosulfan I	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	959-98-8	
Endosulfan II	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	33213-65-9	
Endosulfan sulfate	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	1031-07-8	
Endrin	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	72-20-8	
Endrin aldehyde	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	7421-93-4	
Endrin ketone	ND	ug/kg	10.2	1	03/26/18 07:27	04/04/18 00:45	53494-70-5	
Heptachlor	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	76-44-8	
Heptachlor epoxide	ND	ug/kg	5.1	1	03/26/18 07:27	04/04/18 00:45	1024-57-3	
Methoxychlor	ND	ug/kg	51.4	1	03/26/18 07:27	04/04/18 00:45	72-43-5	
Toxaphene	ND	ug/kg	154	1	03/26/18 07:27	04/04/18 00:45	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	99	%	30-150	1	03/26/18 07:27	04/04/18 00:45	877-09-8	
Decachlorobiphenyl (S)	85	%	30-150	1	03/26/18 07:27	04/04/18 00:45	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	11100-14-4	
PCB, Total	ND	ug/kg	105	1	03/23/18 16:00	03/26/18 18:44	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	46	%	48-125	1	03/23/18 16:00	03/26/18 18:44	877-09-8	S0
Decachlorobiphenyl (S)	40	%	30-134	1	03/23/18 16:00	03/26/18 18:44	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WIDRO C10-C28	166	mg/kg	97.6	1	03/28/18 12:37	03/29/18 12:21		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-A4 (26-32.5) **Lab ID: 10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	79	%	50-150	1	03/28/18 12:37	03/29/18 12:21	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	90.7	1	03/30/18 14:11	03/31/18 00:08		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	03/30/18 14:11	03/31/18 00:08	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	2190	mg/kg	30.5	1	03/26/18 05:53	03/29/18 17:58	7429-90-5	
Barium	140	mg/kg	1.5	1	03/26/18 05:53	03/29/18 17:58	7440-39-3	
Boron	742	mg/kg	22.9	1	03/26/18 05:53	03/29/18 17:58	7440-42-8	
Copper	4.3	mg/kg	1.5	1	03/26/18 05:53	03/29/18 17:58	7440-50-8	
Iron	3870	mg/kg	7.6	1	03/26/18 05:53	03/29/18 17:58	7439-89-6	
Manganese	310	mg/kg	0.76	1	03/26/18 05:53	03/29/18 17:58	7439-96-5	
Nickel	3.6	mg/kg	3.1	1	03/26/18 05:53	03/29/18 17:58	7440-02-0	
Silver	ND	mg/kg	1.5	1	03/26/18 05:53	03/29/18 17:58	7440-22-4	
Tin	ND	mg/kg	11.5	1	03/26/18 05:53	03/29/18 17:58	7440-31-5	
Titanium	62.0	mg/kg	3.8	1	03/26/18 05:53	03/29/18 17:58	7440-32-6	
Zinc	12.7	mg/kg	3.1	1	03/26/18 05:53	03/29/18 17:58	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	ND	mg/kg	2.8	5	03/30/18 09:43	03/31/18 04:47	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.5	20	03/26/18 09:32	04/02/18 11:36	7440-36-0	
Arsenic	ND	mg/kg	1.5	20	03/26/18 09:32	04/02/18 11:36	7440-38-2	
Beryllium	ND	mg/kg	0.60	20	03/26/18 09:32	04/02/18 11:36	7440-41-7	
Cadmium	0.37	mg/kg	0.24	20	03/26/18 09:32	04/02/18 11:36	7440-43-9	
Cobalt	1.9	mg/kg	1.5	20	03/26/18 09:32	04/02/18 11:36	7440-48-4	
Lead	4.2	mg/kg	0.30	20	03/26/18 09:32	04/02/18 11:36	7439-92-1	
Lithium	3.9	mg/kg	1.5	20	03/26/18 09:32	04/02/18 11:36	7439-93-2	
Selenium	ND	mg/kg	1.5	20	03/26/18 09:32	04/02/18 11:36	7782-49-2	
Strontium	65.9	mg/kg	1.5	20	03/26/18 09:32	04/02/18 11:36	7440-24-6	
Vanadium	7.1	mg/kg	3.0	20	03/26/18 09:32	04/02/18 11:36	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.058	1	03/30/18 08:32	03/30/18 11:22	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	67.6	%	0.10	1		03/26/18 14:26		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	83-32-9	
Acenaphthylene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-A4 (26-32.5) **Lab ID: 10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	120-12-7	
Benzo(a)anthracene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	56-55-3	
Benzo(a)pyrene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	85-68-7	
Carbazole	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	59-50-7	
4-Chloroaniline	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	91-58-7	
2-Chlorophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	7005-72-3	
Chrysene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	53-70-3	
Dibenzofuran	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	120-83-2	
Diethylphthalate	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	105-67-9	
Dimethylphthalate	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	15400	1	03/27/18 12:47	03/30/18 13:18	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	117-81-7	
Fluoranthene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	206-44-0	
Fluorene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	87-68-3	
Hexachlorobenzene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	118-74-1	
Hexachloroethane	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	193-39-5	
Isophorone	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-A4 (26-32.5)** Lab ID: **10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	5960	1	03/27/18 12:47	03/30/18 13:18		
Naphthalene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	91-20-3	
2-Nitroaniline	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	88-74-4	
3-Nitroaniline	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	99-09-2	
4-Nitroaniline	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	100-01-6	
Nitrobenzene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	98-95-3	
2-Nitrophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	88-75-5	
4-Nitrophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	86-30-6	
Pentachlorophenol	ND	ug/kg	6050	1	03/27/18 12:47	03/30/18 13:18	87-86-5	
Phenanthrene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	85-01-8	
Phenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	108-95-2	
Pyrene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2980	1	03/27/18 12:47	03/30/18 13:18	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%.	43-125	1	03/27/18 12:47	03/30/18 13:18	4165-60-0	
2-Fluorobiphenyl (S)	81	%.	30-132	1	03/27/18 12:47	03/30/18 13:18	321-60-8	
p-Terphenyl-d14 (S)	100	%.	62-125	1	03/27/18 12:47	03/30/18 13:18	1718-51-0	
Phenol-d6 (S)	79	%.	48-125	1	03/27/18 12:47	03/30/18 13:18	13127-88-3	
2-Fluorophenol (S)	74	%.	40-125	1	03/27/18 12:47	03/30/18 13:18	367-12-4	
2,4,6-Tribromophenol (S)	92	%.	60-125	1	03/27/18 12:47	03/30/18 13:18	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	83-32-9	
Acenaphthylene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	208-96-8	
Anthracene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	120-12-7	
Benzo(a)anthracene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	56-55-3	
Benzo(a)pyrene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	207-08-9	
Chrysene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	53-70-3	
Fluoranthene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	206-44-0	
Fluorene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	193-39-5	
Naphthalene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	91-20-3	
Phenanthrene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	85-01-8	
Pyrene	ND	ug/kg	30.8	1	03/26/18 11:34	03/27/18 17:56	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	63	%.	42-125	1	03/26/18 11:34	03/27/18 17:56	321-60-8	
p-Terphenyl-d14 (S)	78	%.	57-125	1	03/26/18 11:34	03/27/18 17:56	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-A4 (26-32.5) **Lab ID: 10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	25057-89-0	
2,4-D	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	94-75-7	
2,4-DB	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	94-82-6	
Dicamba	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	1918-00-9	
Dinoseb	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	88-85-7	
MCPA	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	94-74-6	
Pentachlorophenol	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	87-86-5	
Picloram	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	1918-02-1	
2,4,5-T	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	93-72-1	
Triclopyr	ND	mg/kg	0.20	1	03/29/18 07:30	04/04/18 15:04	55335-06-3	
Surrogates								
2,4-DCAA (S)	65	%.	46-125	1	03/29/18 07:30	04/04/18 15:04	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	7400	1	03/26/18 10:26	03/26/18 11:14	67-64-1	
Allyl chloride	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	107-05-1	
Benzene	1370	ug/kg	148	1	03/26/18 10:26	03/26/18 11:14	71-43-2	
Bromobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	108-86-1	
Bromochloromethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	74-97-5	
Bromodichloromethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	75-27-4	
Bromoform	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	75-25-2	
Bromomethane	ND	ug/kg	3700	1	03/26/18 10:26	03/26/18 11:14	74-83-9	
2-Butanone (MEK)	ND	ug/kg	1850	1	03/26/18 10:26	03/26/18 11:14	78-93-3	
n-Butylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	104-51-8	
sec-Butylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	135-98-8	
tert-Butylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	98-06-6	
Carbon tetrachloride	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	56-23-5	
Chlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	108-90-7	
Chloroethane	ND	ug/kg	3700	1	03/26/18 10:26	03/26/18 11:14	75-00-3	
Chloroform	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	67-66-3	
Chloromethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	74-87-3	
2-Chlorotoluene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	95-49-8	
4-Chlorotoluene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	3700	1	03/26/18 10:26	03/26/18 11:14	96-12-8	
Dibromochloromethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	106-93-4	
Dibromomethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	75-71-8	
1,1-Dichloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	75-34-3	
1,2-Dichloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	107-06-2	
1,1-Dichloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-A4 (26-32.5) **Lab ID: 10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	156-60-5	
Dichlorofluoromethane	ND	ug/kg	3700	1	03/26/18 10:26	03/26/18 11:14	75-43-4	
1,2-Dichloropropane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	78-87-5	
1,3-Dichloropropane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	142-28-9	
2,2-Dichloropropane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	594-20-7	
1,1-Dichloropropene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	60-29-7	
Ethylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	1850	1	03/26/18 10:26	03/26/18 11:14	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	98-82-8	
p-Isopropyltoluene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	99-87-6	
Methylene Chloride	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	1850	1	03/26/18 10:26	03/26/18 11:14	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	1634-04-4	
Naphthalene	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	91-20-3	
n-Propylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	103-65-1	
Styrene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	79-34-5	N2
Tetrachloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	127-18-4	
Tetrahydrofuran	ND	ug/kg	14800	1	03/26/18 10:26	03/26/18 11:14	109-99-9	
Toluene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	79-00-5	
Trichloroethene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1480	1	03/26/18 10:26	03/26/18 11:14	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	370	1	03/26/18 10:26	03/26/18 11:14	108-67-8	
Vinyl chloride	ND	ug/kg	148	1	03/26/18 10:26	03/26/18 11:14	75-01-4	
Xylene (Total)	ND	ug/kg	1110	1	03/26/18 10:26	03/26/18 11:14	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	89	%	75-125	1	03/26/18 10:26	03/26/18 11:14	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	03/26/18 10:26	03/26/18 11:14	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	03/26/18 10:26	03/26/18 11:14	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent ND mg/kg 305 50 03/30/18 14:00 04/03/18 11:34 18540-29-9 D3

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent ND mg/kg 1.0 1 04/05/18 08:57 16065-83-1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-A4 (26-32.5) **Lab ID: 10424609001** Collected: 03/22/18 11:25 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	1.1	1	03/29/18 10:55	03/29/18 13:05	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	0.98	1	03/29/18 15:45	03/30/18 21:53	16984-48-8	

Sample: FD-SB-B4-WM (3-20 WM) **Lab ID: 10424609002** Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	17.1	1	03/30/18 11:35	04/02/18 15:26	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	309-00-2	
alpha-BHC	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	319-84-6	
beta-BHC	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	319-85-7	
delta-BHC	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	58-89-9	
Chlordane (Technical)	ND	ug/kg	256	10	03/26/18 07:27	04/04/18 01:04	57-74-9	
alpha-Chlordane	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	5103-71-9	
gamma-Chlordane	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	5103-74-2	
4,4'-DDD	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	72-54-8	
4,4'-DDE	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	72-55-9	
4,4'-DDT	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	50-29-3	
Dieldrin	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	60-57-1	
Endosulfan I	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	959-98-8	
Endosulfan II	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	33213-65-9	
Endosulfan sulfate	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	1031-07-8	
Endrin	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	72-20-8	
Endrin aldehyde	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	7421-93-4	
Endrin ketone	ND	ug/kg	51.0	10	03/26/18 07:27	04/04/18 01:04	53494-70-5	
Heptachlor	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	76-44-8	
Heptachlor epoxide	ND	ug/kg	25.6	10	03/26/18 07:27	04/04/18 01:04	1024-57-3	
Methoxychlor	ND	ug/kg	256	10	03/26/18 07:27	04/04/18 01:04	72-43-5	
Toxaphene	ND	ug/kg	765	10	03/26/18 07:27	04/04/18 01:04	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	03/26/18 07:27	04/04/18 01:04	877-09-8	5M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	10	03/26/18 07:27	04/04/18 01:04	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11141-16-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-B4-WM (3-20 WM) Lab ID: 10424609002 Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1242 (Aroclor 1242)	3330	ug/kg	101	2	03/23/18 16:00	03/27/18 08:04	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	12672-29-6	
PCB-1254 (Aroclor 1254)	887	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	50.5	1	03/23/18 16:00	03/26/18 19:00	11100-14-4	
PCB, Total	4220	ug/kg	101	2	03/23/18 16:00	03/27/18 08:04	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	94	%.	48-125	1	03/23/18 16:00	03/26/18 19:00	877-09-8	
Decachlorobiphenyl (S)	73	%.	30-134	1	03/23/18 16:00	03/26/18 19:00	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1570	mg/kg	153	10	03/28/18 12:37	03/29/18 16:15		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	03/28/18 12:37	03/29/18 16:15	638-68-6	7M, S4
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	243	mg/kg	29.3	1	03/30/18 14:11	03/31/18 00:32		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	03/30/18 14:11	03/31/18 00:32	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7510	mg/kg	15.2	1	03/26/18 05:53	03/29/18 18:02	7429-90-5	
Barium	194	mg/kg	0.76	1	03/26/18 05:53	03/29/18 18:02	7440-39-3	
Boron	112	mg/kg	11.4	1	03/26/18 05:53	03/29/18 18:02	7440-42-8	
Copper	474	mg/kg	0.76	1	03/26/18 05:53	03/29/18 18:02	7440-50-8	
Iron	32100	mg/kg	19.0	5	03/26/18 05:53	03/30/18 10:32	7439-89-6	
Manganese	270	mg/kg	0.38	1	03/26/18 05:53	03/29/18 18:02	7439-96-5	
Nickel	30.3	mg/kg	1.5	1	03/26/18 05:53	03/29/18 18:02	7440-02-0	
Silver	2.0	mg/kg	0.76	1	03/26/18 05:53	03/29/18 18:02	7440-22-4	
Tin	42.9	mg/kg	5.7	1	03/26/18 05:53	03/29/18 18:02	7440-31-5	
Titanium	260	mg/kg	1.9	1	03/26/18 05:53	03/29/18 18:02	7440-32-6	
Zinc	692	mg/kg	1.5	1	03/26/18 05:53	03/29/18 18:02	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	35.9	mg/kg	1.5	5	03/30/18 09:43	03/31/18 04:52	7440-47-3	N2
6020A MET ICPMS								
Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	5.0	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7440-36-0	
Arsenic	12.2	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7440-38-2	
Beryllium	1.6	mg/kg	0.29	20	03/26/18 09:32	04/02/18 11:40	7440-41-7	
Cadmium	4.0	mg/kg	0.11	20	03/26/18 09:32	04/02/18 11:40	7440-43-9	
Cobalt	10	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7440-48-4	
Lead	575	mg/kg	0.14	20	03/26/18 09:32	04/02/18 11:40	7439-92-1	
Lithium	10.3	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7439-93-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-B4-WM (3-20 WM) Lab ID: 10424609002 Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS								
Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Selenium	3.5	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7782-49-2	
Strontium	176	mg/kg	0.72	20	03/26/18 09:32	04/02/18 11:40	7440-24-6	
Vanadium	44.6	mg/kg	1.4	20	03/26/18 09:32	04/02/18 11:40	7440-62-2	
7471 Mercury								
Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.52	mg/kg	0.030	1	03/30/18 08:32	03/30/18 11:28	7439-97-6	
Dry Weight / %M by ASTM D2974								
Analytical Method: ASTM D2974								
Percent Moisture	34.7	%	0.10	1		03/26/18 14:26		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	83-32-9	
Acenaphthylene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	208-96-8	
Anthracene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	120-12-7	
Benzo(a)anthracene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	56-55-3	
Benzo(a)pyrene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	50-32-8	
Benzo(b)fluoranthene	650	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	101-55-3	
Butylbenzylphthalate	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	85-68-7	
Carbazole	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	59-50-7	
4-Chloroaniline	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	108-60-1	
2-Chloronaphthalene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	91-58-7	
2-Chlorophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	7005-72-3	
Chrysene	558	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	53-70-3	
Dibenzofuran	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	120-83-2	
Diethylphthalate	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	105-67-9	
Dimethylphthalate	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	131-11-3	
Di-n-butylphthalate	516	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2590	1	03/27/18 12:47	03/30/18 15:20	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	121-14-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-B4-WM (3-20 WM)** Lab ID: **10424609002** Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2,6-Dinitrotoluene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	606-20-2	
Di-n-octylphthalate	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	122-66-7	
bis(2-Ethylhexyl)phthalate	7900	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	117-81-7	
Fluoranthene	1560	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	206-44-0	
Fluorene	666	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	87-68-3	
Hexachlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	118-74-1	
Hexachloroethane	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	193-39-5	
Isophorone	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	78-59-1	
1-Methylnaphthalene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	90-12-0	
2-Methylnaphthalene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1010	1	03/27/18 12:47	03/30/18 15:20		
Naphthalene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	91-20-3	
2-Nitroaniline	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	88-74-4	
3-Nitroaniline	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	99-09-2	
4-Nitroaniline	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	100-01-6	
Nitrobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	98-95-3	
2-Nitrophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	88-75-5	
4-Nitrophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	621-64-7	
N-Nitrosodiphenylamine	759	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	86-30-6	
Pentachlorophenol	ND	ug/kg	1020	1	03/27/18 12:47	03/30/18 15:20	87-86-5	
Phenanthrene	2410	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	85-01-8	
Phenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	108-95-2	
Pyrene	1100	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	504	1	03/27/18 12:47	03/30/18 15:20	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	56	%	43-125	1	03/27/18 12:47	03/30/18 15:20	4165-60-0	
2-Fluorobiphenyl (S)	67	%	30-132	1	03/27/18 12:47	03/30/18 15:20	321-60-8	
p-Terphenyl-d14 (S)	58	%	62-125	1	03/27/18 12:47	03/30/18 15:20	1718-51-0	S5
Phenol-d6 (S)	58	%	48-125	1	03/27/18 12:47	03/30/18 15:20	13127-88-3	
2-Fluorophenol (S)	53	%	40-125	1	03/27/18 12:47	03/30/18 15:20	367-12-4	
2,4,6-Tribromophenol (S)	63	%	60-125	1	03/27/18 12:47	03/30/18 15:20	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	514	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	83-32-9	
Acenaphthylene	ND	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	208-96-8	
Anthracene	1080	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	120-12-7	
Benzo(a)anthracene	2620	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	56-55-3	
Benzo(a)pyrene	2430	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	50-32-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-B4-WM (3-20 WM)** Lab ID: **10424609002** Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Benzo(b)fluoranthene	2860	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	205-99-2	
Benzo(g,h,i)perylene	1640	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	191-24-2	
Benzo(k)fluoranthene	1120	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	207-08-9	
Chrysene	2750	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	218-01-9	
Dibenz(a,h)anthracene	368	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	53-70-3	
Fluoranthene	5350	ug/kg	305	20	03/26/18 11:34	03/28/18 12:31	206-44-0	
Fluorene	974	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	86-73-7	
Indeno(1,2,3-cd)pyrene	1270	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	193-39-5	
Naphthalene	746	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	91-20-3	
Phenanthrene	4450	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	85-01-8	
Pyrene	4740	ug/kg	153	10	03/26/18 11:34	03/27/18 20:30	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	10	03/26/18 11:34	03/27/18 20:30	321-60-8	D3,S4
p-Terphenyl-d14 (S)	0	%.	57-125	10	03/26/18 11:34	03/27/18 20:30	1718-51-0	S4
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	25057-89-0	
2,4-D	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	94-75-7	
2,4-DB	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	94-82-6	
Dicamba	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	1918-00-9	
Dinoseb	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	88-85-7	
MCPA	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	94-74-6	
Pentachlorophenol	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	87-86-5	
Picloram	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	1918-02-1	
2,4,5-T	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	93-72-1	
Triclopyr	ND	mg/kg	0.051	1	03/29/18 07:30	04/04/18 15:18	55335-06-3	
Surrogates								
2,4-DCAA (S)	53	%.	46-125	1	03/29/18 07:30	04/04/18 15:18	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2870	1	03/26/18 09:03	03/26/18 13:44	67-64-1	
Allyl chloride	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	107-05-1	
Benzene	ND	ug/kg	57.5	1	03/26/18 09:03	03/26/18 13:44	71-43-2	
Bromobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	108-86-1	
Bromochloromethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	74-97-5	
Bromodichloromethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	75-27-4	
Bromoform	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	75-25-2	
Bromomethane	ND	ug/kg	1440	1	03/26/18 09:03	03/26/18 13:44	74-83-9	
2-Butanone (MEK)	ND	ug/kg	718	1	03/26/18 09:03	03/26/18 13:44	78-93-3	
n-Butylbenzene	989	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	104-51-8	
sec-Butylbenzene	663	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	135-98-8	
tert-Butylbenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	98-06-6	
Carbon tetrachloride	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	56-23-5	
Chlorobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	108-90-7	
Chloroethane	ND	ug/kg	1440	1	03/26/18 09:03	03/26/18 13:44	75-00-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-B4-WM (3-20 WM)** Lab ID: **10424609002** Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Chloroform	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	67-66-3	
Chloromethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	74-87-3	
2-Chlorotoluene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	95-49-8	
4-Chlorotoluene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1440	1	03/26/18 09:03	03/26/18 13:44	96-12-8	
Dibromochloromethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	106-93-4	
Dibromomethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	74-95-3	
1,2-Dichlorobenzene	259	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	541-73-1	
1,4-Dichlorobenzene	810	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	75-71-8	
1,1-Dichloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	75-34-3	
1,2-Dichloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	107-06-2	
1,1-Dichloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1440	1	03/26/18 09:03	03/26/18 13:44	75-43-4	
1,2-Dichloropropane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	78-87-5	
1,3-Dichloropropane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	142-28-9	
2,2-Dichloropropane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	594-20-7	
1,1-Dichloropropene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	60-29-7	
Ethylbenzene	1380	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	718	1	03/26/18 09:03	03/26/18 13:44	87-68-3	
Isopropylbenzene (Cumene)	412	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	98-82-8	
p-Isopropyltoluene	5250	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	99-87-6	
Methylene Chloride	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	718	1	03/26/18 09:03	03/26/18 13:44	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	1634-04-4	
Naphthalene	3240	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	91-20-3	
n-Propylbenzene	880	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	103-65-1	
Styrene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	79-34-5	N2
Tetrachloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	127-18-4	
Tetrahydrofuran	ND	ug/kg	5750	1	03/26/18 09:03	03/26/18 13:44	109-99-9	
Toluene	208	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	79-00-5	
Trichloroethene	ND	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	75-69-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-B4-WM (3-20 WM) Lab ID: 10424609002 Collected: 03/22/18 13:20 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,3-Trichloropropane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	575	1	03/26/18 09:03	03/26/18 13:44	76-13-1	
1,2,4-Trimethylbenzene	6930	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	95-63-6	
1,3,5-Trimethylbenzene	2230	ug/kg	144	1	03/26/18 09:03	03/26/18 13:44	108-67-8	
Vinyl chloride	ND	ug/kg	57.5	1	03/26/18 09:03	03/26/18 13:44	75-01-4	
Xylene (Total)	5100	ug/kg	431	1	03/26/18 09:03	03/26/18 13:44	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%.	75-125	1	03/26/18 09:03	03/26/18 13:44	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/26/18 09:03	03/26/18 13:44	2037-26-5	
4-Bromofluorobenzene (S)	115	%.	75-125	1	03/26/18 09:03	03/26/18 13:44	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	30.3	10	03/30/18 14:00	04/03/18 11:34	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	35.9	mg/kg	1.0	1		04/05/18 08:57	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.47	mg/kg	0.37	1	03/29/18 10:55	03/29/18 13:09	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	03/29/18 15:45	03/30/18 22:32	16984-48-8	

Sample: FD-SB-C4-WM (5-20 WM) Lab ID: 10424609003 Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	11.1	1	03/30/18 11:35	04/02/18 15:32	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	309-00-2	
alpha-BHC	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	319-84-6	
beta-BHC	159	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	319-85-7	
delta-BHC	146	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	58-89-9	
Chlordane (Technical)	ND	ug/kg	1040	50	03/26/18 07:27	04/04/18 01:40	57-74-9	
alpha-Chlordane	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	5103-71-9	
gamma-Chlordane	161	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	5103-74-2	
4,4'-DDD	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	72-54-8	
4,4'-DDE	277	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	72-55-9	
4,4'-DDT	767	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	50-29-3	
Dieldrin	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	60-57-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-C4-WM (5-20 WM)** Lab ID: **10424609003** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Endosulfan I	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	959-98-8	
Endosulfan II	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	33213-65-9	
Endosulfan sulfate	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	1031-07-8	
Endrin	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	72-20-8	
Endrin aldehyde	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	7421-93-4	
Endrin ketone	ND	ug/kg	207	50	03/26/18 07:27	04/04/18 01:40	53494-70-5	
Heptachlor	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	76-44-8	
Heptachlor epoxide	ND	ug/kg	104	50	03/26/18 07:27	04/04/18 01:40	1024-57-3	
Methoxychlor	ND	ug/kg	1040	50	03/26/18 07:27	04/04/18 01:40	72-43-5	
Toxaphene	ND	ug/kg	3120	50	03/26/18 07:27	04/04/18 01:40	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	50	03/26/18 07:27	04/04/18 01:40	877-09-8	4M, D4, S4
Decachlorobiphenyl (S)	0	%.	30-150	50	03/26/18 07:27	04/04/18 01:40	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	11141-16-5	
PCB-1242 (Aroclor 1242)	39900	ug/kg	2060	50	03/23/18 16:00	03/27/18 08:20	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	12672-29-6	
PCB-1254 (Aroclor 1254)	5350	ug/kg	2060	50	03/23/18 16:00	03/27/18 08:20	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	41.2	1	03/23/18 16:00	03/26/18 19:16	11100-14-4	
PCB, Total	45200	ug/kg	2060	50	03/23/18 16:00	03/27/18 08:20	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	205	%.	48-125	1	03/23/18 16:00	03/26/18 19:16	877-09-8	S0
Decachlorobiphenyl (S)	65	%.	30-134	1	03/23/18 16:00	03/26/18 19:16	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1160	mg/kg	124	10	03/28/18 12:37	03/29/18 10:49		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	03/28/18 12:37	03/29/18 10:49	638-68-6	7M, S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	104	mg/kg	13.3	1	03/30/18 14:11	03/30/18 18:05		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	03/30/18 14:11	03/30/18 18:05	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3810	mg/kg	11.9	1	03/26/18 05:53	03/29/18 18:06	7429-90-5	
Barium	227	mg/kg	0.59	1	03/26/18 05:53	03/29/18 18:06	7440-39-3	
Boron	87.4	mg/kg	8.9	1	03/26/18 05:53	03/29/18 18:06	7440-42-8	
Copper	51.6	mg/kg	0.59	1	03/26/18 05:53	03/29/18 18:06	7440-50-8	
Iron	42300	mg/kg	29.7	10	03/26/18 05:53	03/30/18 10:36	7439-89-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-C4-WM (5-20 WM) Lab ID: 10424609003 Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Manganese	645	mg/kg	0.30	1	03/26/18 05:53	03/29/18 18:06	7439-96-5	
Nickel	14.9	mg/kg	1.2	1	03/26/18 05:53	03/29/18 18:06	7440-02-0	
Silver	ND	mg/kg	0.59	1	03/26/18 05:53	03/29/18 18:06	7440-22-4	
Tin	57.7	mg/kg	4.5	1	03/26/18 05:53	03/29/18 18:06	7440-31-5	
Titanium	156	mg/kg	1.5	1	03/26/18 05:53	03/29/18 18:06	7440-32-6	
Zinc	450	mg/kg	1.2	1	03/26/18 05:53	03/29/18 18:06	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	31.2	mg/kg	1.2	5	03/30/18 09:43	03/31/18 04:57	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.5	mg/kg	0.60	20	03/26/18 09:32	04/02/18 11:45	7440-36-0	
Arsenic	6.5	mg/kg	0.60	20	03/26/18 09:32	04/02/18 11:45	7440-38-2	
Beryllium	0.31	mg/kg	0.24	20	03/26/18 09:32	04/02/18 11:45	7440-41-7	
Cadmium	46.2	mg/kg	0.096	20	03/26/18 09:32	04/02/18 11:45	7440-43-9	
Cobalt	6.9	mg/kg	0.60	20	03/26/18 09:32	04/02/18 11:45	7440-48-4	
Lead	989	mg/kg	0.12	20	03/26/18 09:32	04/02/18 11:45	7439-92-1	
Lithium	4.4	mg/kg	0.60	20	03/26/18 09:32	04/02/18 11:45	7439-93-2	
Selenium	0.67	mg/kg	0.60	20	03/26/18 09:32	04/02/18 11:45	7782-49-2	
Strontium	53.0	mg/kg	0.60	20	03/26/18 09:32	04/02/18 11:45	7440-24-6	
Vanadium	16.5	mg/kg	1.2	20	03/26/18 09:32	04/02/18 11:45	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	8.6	mg/kg	0.50	20	03/30/18 08:32	03/30/18 11:36	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	19.9	%	0.10	1		03/26/18 14:26		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	83-32-9	
Acenaphthylene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	208-96-8	
Anthracene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	120-12-7	
Benzo(a)anthracene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	56-55-3	
Benzo(a)pyrene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	101-55-3	
Butylbenzylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	85-68-7	
Carbazole	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	59-50-7	
4-Chloroaniline	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	108-60-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-C4-WM (5-20 WM) **Lab ID: 10424609003** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Chloronaphthalene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	91-58-7	
2-Chlorophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	7005-72-3	
Chrysene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	53-70-3	
Dibenzofuran	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	120-83-2	
Diethylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	105-67-9	
Dimethylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	131-11-3	
Di-n-butylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2120	1	03/27/18 12:47	03/31/18 18:35	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	606-20-2	
Di-n-octylphthalate	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	122-66-7	
bis(2-Ethylhexyl)phthalate	1220	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	117-81-7	
Fluoranthene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	206-44-0	
Fluorene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	87-68-3	
Hexachlorobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	118-74-1	
Hexachloroethane	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	193-39-5	
Isophorone	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	78-59-1	
1-Methylnaphthalene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	90-12-0	
2-Methylnaphthalene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	823	1	03/27/18 12:47	03/31/18 18:35		
Naphthalene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	91-20-3	
2-Nitroaniline	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	88-74-4	
3-Nitroaniline	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	99-09-2	
4-Nitroaniline	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	100-01-6	
Nitrobenzene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	98-95-3	
2-Nitrophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	88-75-5	
4-Nitrophenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	86-30-6	
Pentachlorophenol	ND	ug/kg	836	1	03/27/18 12:47	03/31/18 18:35	87-86-5	
Phenanthrene	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	85-01-8	
Phenol	ND	ug/kg	412	1	03/27/18 12:47	03/31/18 18:35	108-95-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-C4-WM (5-20 WM)** Lab ID: **10424609003** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Surrogates								
2,4-DCAA (S)	71	%.	46-125	1	03/29/18 07:30	04/04/18 15:33	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1380	1	03/26/18 09:03	03/26/18 14:01	67-64-1	
Allyl chloride	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	107-05-1	
Benzene	70.9	ug/kg	27.5	1	03/26/18 09:03	03/26/18 14:01	71-43-2	
Bromobenzene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	108-86-1	
Bromochloromethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	74-97-5	
Bromodichloromethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	75-27-4	
Bromoform	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	75-25-2	
Bromomethane	ND	ug/kg	688	1	03/26/18 09:03	03/26/18 14:01	74-83-9	
2-Butanone (MEK)	ND	ug/kg	344	1	03/26/18 09:03	03/26/18 14:01	78-93-3	
n-Butylbenzene	1120	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	104-51-8	
sec-Butylbenzene	520	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	135-98-8	
tert-Butylbenzene	79.8	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	98-06-6	
Carbon tetrachloride	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	56-23-5	
Chlorobenzene	122	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	108-90-7	
Chloroethane	ND	ug/kg	688	1	03/26/18 09:03	03/26/18 14:01	75-00-3	
Chloroform	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	67-66-3	
Chloromethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	74-87-3	
2-Chlorotoluene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	95-49-8	
4-Chlorotoluene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	688	1	03/26/18 09:03	03/26/18 14:01	96-12-8	
Dibromochloromethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	106-93-4	
Dibromomethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	74-95-3	
1,2-Dichlorobenzene	506	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	541-73-1	
1,4-Dichlorobenzene	590	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	75-71-8	
1,1-Dichloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	75-34-3	
1,2-Dichloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	107-06-2	
1,1-Dichloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	156-60-5	
Dichlorofluoromethane	ND	ug/kg	688	1	03/26/18 09:03	03/26/18 14:01	75-43-4	
1,2-Dichloropropane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	78-87-5	
1,3-Dichloropropane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	142-28-9	
2,2-Dichloropropane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	594-20-7	
1,1-Dichloropropene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	60-29-7	
Ethylbenzene	3310	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	344	1	03/26/18 09:03	03/26/18 14:01	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-C4-WM (5-20 WM) Lab ID: 10424609003 Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	1030	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	98-82-8	
p-Isopropyltoluene	1760	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	99-87-6	
Methylene Chloride	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	344	1	03/26/18 09:03	03/26/18 14:01	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	1634-04-4	
Naphthalene	5570	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	91-20-3	
n-Propylbenzene	1130	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	103-65-1	
Styrene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	79-34-5	N2
Tetrachloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	127-18-4	
Tetrahydrofuran	ND	ug/kg	2750	1	03/26/18 09:03	03/26/18 14:01	109-99-9	
Toluene	288	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	79-00-5	
Trichloroethene	ND	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	275	1	03/26/18 09:03	03/26/18 14:01	76-13-1	
1,2,4-Trimethylbenzene	5820	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	95-63-6	
1,3,5-Trimethylbenzene	1920	ug/kg	68.8	1	03/26/18 09:03	03/26/18 14:01	108-67-8	
Vinyl chloride	ND	ug/kg	27.5	1	03/26/18 09:03	03/26/18 14:01	75-01-4	
Xylene (Total)	6550	ug/kg	206	1	03/26/18 09:03	03/26/18 14:01	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	03/26/18 09:03	03/26/18 14:01	17060-07-0	
Toluene-d8 (S)	99	%	75-125	1	03/26/18 09:03	03/26/18 14:01	2037-26-5	
4-Bromofluorobenzene (S)	109	%	75-125	1	03/26/18 09:03	03/26/18 14:01	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	25.1	10	03/30/18 14:00	04/03/18 11:34	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	31.2	mg/kg	1.0	1		04/05/18 08:57	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.53	1	03/29/18 10:55	03/29/18 13:09	57-12-5	M0
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	03/29/18 15:45	03/30/18 23:12	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.68	1	03/30/18 11:35	04/02/18 15:39	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	309-00-2	M6
alpha-BHC	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	319-84-6	M6
beta-BHC	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	319-85-7	M6
delta-BHC	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	58-89-9	M6
Chlordane (Technical)	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	57-74-9	
alpha-Chlordane	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	5103-71-9	
gamma-Chlordane	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	5103-74-2	M6
4,4'-DDD	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	72-54-8	M6
4,4'-DDE	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	72-55-9	
4,4'-DDT	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	50-29-3	
Dieldrin	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	60-57-1	M6
Endosulfan I	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	959-98-8	M6
Endosulfan II	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	33213-65-9	
Endosulfan sulfate	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	1031-07-8	
Endrin	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	72-20-8	M6
Endrin aldehyde	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	7421-93-4	M6
Endrin ketone	ND	ug/kg	88.0	20	03/26/18 07:27	04/03/18 21:06	53494-70-5	
Heptachlor	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	76-44-8	M6
Heptachlor epoxide	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	1024-57-3	
Methoxychlor	ND	ug/kg	44.1	20	03/26/18 07:27	04/03/18 21:06	72-43-5	
Toxaphene	ND	ug/kg	1320	20	03/26/18 07:27	04/03/18 21:06	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/26/18 07:27	04/03/18 21:06	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	03/26/18 07:27	04/03/18 21:06	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11141-16-5	
PCB-1242 (Aroclor 1242)	306	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	12672-29-6	
PCB-1254 (Aroclor 1254)	91.8	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	11100-14-4	
PCB, Total	398	ug/kg	43.5	1	03/23/18 16:00	03/26/18 19:32	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	40	%	48-125	1	03/23/18 16:00	03/26/18 19:32	877-09-8	S0
Decachlorobiphenyl (S)	42	%	30-134	1	03/23/18 16:00	03/26/18 19:32	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	383	mg/kg	81.8	5	03/28/18 12:37	03/29/18 16:29		T6
Surrogates								
n-Triacontane (S)	95	%	50-150	5	03/28/18 12:37	03/29/18 16:29	638-68-6	7M
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	257	mg/kg	20.6	1	03/30/18 14:11	03/31/18 00:56		
Surrogates								
a,a,a-Trifluorotoluene (S)	96	%	80-150	1	03/30/18 14:11	03/31/18 00:56	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	5710	mg/kg	12.8	1	03/26/18 05:53	03/29/18 18:10	7429-90-5	
Barium	177	mg/kg	0.64	1	03/26/18 05:53	03/29/18 18:10	7440-39-3	
Boron	62.7	mg/kg	9.6	1	03/26/18 05:53	03/29/18 18:10	7440-42-8	
Copper	64.6	mg/kg	0.64	1	03/26/18 05:53	03/29/18 18:10	7440-50-8	
Iron	65700	mg/kg	32.1	10	03/26/18 05:53	03/30/18 10:42	7439-89-6	
Manganese	532	mg/kg	0.32	1	03/26/18 05:53	03/29/18 18:10	7439-96-5	
Nickel	33.3	mg/kg	1.3	1	03/26/18 05:53	03/29/18 18:10	7440-02-0	
Silver	2.4	mg/kg	0.64	1	03/26/18 05:53	03/29/18 18:10	7440-22-4	
Tin	49.5	mg/kg	4.8	1	03/26/18 05:53	03/29/18 18:10	7440-31-5	
Titanium	244	mg/kg	1.6	1	03/26/18 05:53	03/29/18 18:10	7440-32-6	
Zinc	1360	mg/kg	1.3	1	03/26/18 05:53	03/29/18 18:10	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	36.8	mg/kg	1.2	5	03/30/18 09:43	03/31/18 05:28	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7440-36-0	
Arsenic	15.1	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7440-38-2	
Beryllium	1.3	mg/kg	0.25	20	03/26/18 09:32	04/02/18 11:50	7440-41-7	
Cadmium	1.4	mg/kg	0.099	20	03/26/18 09:32	04/02/18 11:50	7440-43-9	
Cobalt	7.5	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7440-48-4	
Lead	178	mg/kg	0.12	20	03/26/18 09:32	04/02/18 11:50	7439-92-1	
Lithium	11.8	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7439-93-2	
Selenium	2.6	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7782-49-2	
Strontium	70.1	mg/kg	0.62	20	03/26/18 09:32	04/02/18 11:50	7440-24-6	
Vanadium	64.1	mg/kg	1.2	20	03/26/18 09:32	04/02/18 11:50	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.97	mg/kg	0.025	1	03/30/18 08:32	03/30/18 11:42	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	24.4	%	0.10	1		03/26/18 14:27		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	208-96-8	
Anthracene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	120-12-7	
Benzo(a)anthracene	2230	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	56-55-3	
Benzo(a)pyrene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	50-32-8	
Benzo(b)fluoranthene	2530	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	85-68-7	
Carbazole	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	59-50-7	
4-Chloroaniline	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	91-58-7	
2-Chlorophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	7005-72-3	
Chrysene	2250	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	53-70-3	
Dibenzofuran	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	120-83-2	
Diethylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	105-67-9	
Dimethylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	11200	5	03/27/18 12:47	03/30/18 22:24	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	117-81-7	
Fluoranthene	5620	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	206-44-0	
Fluorene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	87-68-3	
Hexachlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	118-74-1	
Hexachloroethane	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	193-39-5	
Isophorone	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	4360	5	03/27/18 12:47	03/30/18 22:24		
Naphthalene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	91-20-3	
2-Nitroaniline	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	88-74-4	
3-Nitroaniline	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	99-09-2	
4-Nitroaniline	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	100-01-6	
Nitrobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	98-95-3	
2-Nitrophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	88-75-5	
4-Nitrophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	86-30-6	
Pentachlorophenol	ND	ug/kg	4420	5	03/27/18 12:47	03/30/18 22:24	87-86-5	
Phenanthrene	5730	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	85-01-8	
Phenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	108-95-2	
Pyrene	4640	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2180	5	03/27/18 12:47	03/30/18 22:24	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	64	%	43-125	5	03/27/18 12:47	03/30/18 22:24	4165-60-0	D4
2-Fluorobiphenyl (S)	78	%	30-132	5	03/27/18 12:47	03/30/18 22:24	321-60-8	
p-Terphenyl-d14 (S)	78	%	62-125	5	03/27/18 12:47	03/30/18 22:24	1718-51-0	
Phenol-d6 (S)	69	%	48-125	5	03/27/18 12:47	03/30/18 22:24	13127-88-3	
2-Fluorophenol (S)	60	%	40-125	5	03/27/18 12:47	03/30/18 22:24	367-12-4	
2,4,6-Tribromophenol (S)	70	%	60-125	5	03/27/18 12:47	03/30/18 22:24	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	3710	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	83-32-9	
Acenaphthylene	ND	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	208-96-8	
Anthracene	5750	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	120-12-7	
Benzo(a)anthracene	5690	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	56-55-3	
Benzo(a)pyrene	4250	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	50-32-8	
Benzo(b)fluoranthene	4130	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	205-99-2	
Benzo(g,h,i)perylene	2030	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	191-24-2	
Benzo(k)fluoranthene	1680	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	207-08-9	
Chrysene	4660	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	53-70-3	
Fluoranthene	13200	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	206-44-0	
Fluorene	4140	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	86-73-7	
Indeno(1,2,3-cd)pyrene	1690	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	193-39-5	
Naphthalene	8120	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	91-20-3	
Phenanthrene	15000	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	85-01-8	
Pyrene	10200	ug/kg	1320	10	03/26/18 11:34	03/27/18 21:14	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	10	03/26/18 11:34	03/27/18 21:14	321-60-8	D3,P3, S4
p-Terphenyl-d14 (S)	0	%.	57-125	10	03/26/18 11:34	03/27/18 21:14	1718-51-0	S4
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	25057-89-0	
2,4-D	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	94-75-7	
2,4-DB	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	94-82-6	
Dicamba	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	1918-00-9	
Dinoseb	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	88-85-7	
MCPA	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	94-74-6	
Pentachlorophenol	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	87-86-5	
Picloram	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	1918-02-1	
2,4,5-T	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	93-72-1	
Triclopyr	ND	mg/kg	0.043	1	03/29/18 07:30	04/04/18 15:48	55335-06-3	
Surrogates								
2,4-DCAA (S)	64	%.	46-125	1	03/29/18 07:30	04/04/18 15:48	19719-28-9	
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1650	1	03/26/18 09:03	03/26/18 14:17	67-64-1	
Allyl chloride	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	107-05-1	
Benzene	ND	ug/kg	32.9	1	03/26/18 09:03	03/26/18 14:17	71-43-2	
Bromobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	108-86-1	
Bromochloromethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	74-97-5	
Bromodichloromethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	75-27-4	
Bromoform	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	75-25-2	
Bromomethane	ND	ug/kg	824	1	03/26/18 09:03	03/26/18 14:17	74-83-9	
2-Butanone (MEK)	ND	ug/kg	412	1	03/26/18 09:03	03/26/18 14:17	78-93-3	
n-Butylbenzene	1130	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	104-51-8	
sec-Butylbenzene	696	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	135-98-8	
tert-Butylbenzene	84.4	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	98-06-6	
Carbon tetrachloride	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	56-23-5	
Chlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	108-90-7	
Chloroethane	ND	ug/kg	824	1	03/26/18 09:03	03/26/18 14:17	75-00-3	
Chloroform	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	67-66-3	
Chloromethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	74-87-3	
2-Chlorotoluene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	95-49-8	
4-Chlorotoluene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	824	1	03/26/18 09:03	03/26/18 14:17	96-12-8	
Dibromochloromethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	106-93-4	
Dibromomethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	541-73-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-D4-WM (5-20)** Lab ID: **10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,4-Dichlorobenzene	262	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	75-71-8	
1,1-Dichloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	75-34-3	
1,2-Dichloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	107-06-2	
1,1-Dichloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	156-60-5	
Dichlorofluoromethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	75-43-4	
1,2-Dichloropropane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	78-87-5	
1,3-Dichloropropane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	142-28-9	
2,2-Dichloropropane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	594-20-7	
1,1-Dichloropropene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	60-29-7	
Ethylbenzene	231	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	412	1	03/26/18 09:03	03/26/18 14:17	87-68-3	
Isopropylbenzene (Cumene)	401	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	98-82-8	
p-Isopropyltoluene	998	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	99-87-6	
Methylene Chloride	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	412	1	03/26/18 09:03	03/26/18 14:17	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	1634-04-4	
Naphthalene	4360	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	91-20-3	
n-Propylbenzene	684	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	103-65-1	
Styrene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	79-34-5	N2
Tetrachloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	127-18-4	
Tetrahydrofuran	ND	ug/kg	3290	1	03/26/18 09:03	03/26/18 14:17	109-99-9	
Toluene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	79-00-5	
Trichloroethene	ND	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	329	1	03/26/18 09:03	03/26/18 14:17	76-13-1	
1,2,4-Trimethylbenzene	5480	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	95-63-6	
1,3,5-Trimethylbenzene	1590	ug/kg	82.4	1	03/26/18 09:03	03/26/18 14:17	108-67-8	
Vinyl chloride	ND	ug/kg	32.9	1	03/26/18 09:03	03/26/18 14:17	75-01-4	
Xylene (Total)	14900	ug/kg	247	1	03/26/18 09:03	03/26/18 14:17	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	03/26/18 09:03	03/26/18 14:17	17060-07-0	
Toluene-d8 (S)	99	%	75-125	1	03/26/18 09:03	03/26/18 14:17	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125	1	03/26/18 09:03	03/26/18 14:17	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-D4-WM (5-20) **Lab ID: 10424609004** Collected: 03/22/18 15:50 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	13.2	5	03/30/18 14:00	04/03/18 11:35	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	36.8	mg/kg	1.0	1		04/05/18 08:57	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	0.47	mg/kg	0.34	1	03/29/18 10:55	03/29/18 13:13	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	1.1	mg/kg	0.99	1	03/29/18 15:45	03/30/18 22:52	16984-48-8	

Sample: FD-SB-E4-WM (3-21) **Lab ID: 10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	15.7	1	03/30/18 11:35	04/02/18 15:59	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	309-00-2	
alpha-BHC	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	319-84-6	
beta-BHC	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	319-85-7	
delta-BHC	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	58-89-9	
Chlordane (Technical)	ND	ug/kg	433	20	03/26/18 07:27	04/04/18 01:22	57-74-9	
alpha-Chlordane	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	5103-71-9	
gamma-Chlordane	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	5103-74-2	
4,4'-DDD	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	72-54-8	
4,4'-DDE	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	72-55-9	
4,4'-DDT	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	50-29-3	
Dieldrin	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	60-57-1	
Endosulfan I	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	959-98-8	
Endosulfan II	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	33213-65-9	
Endosulfan sulfate	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	1031-07-8	
Endrin	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	72-20-8	
Endrin aldehyde	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	7421-93-4	
Endrin ketone	ND	ug/kg	86.4	20	03/26/18 07:27	04/04/18 01:22	53494-70-5	
Heptachlor	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	76-44-8	
Heptachlor epoxide	ND	ug/kg	43.3	20	03/26/18 07:27	04/04/18 01:22	1024-57-3	
Methoxychlor	ND	ug/kg	433	20	03/26/18 07:27	04/04/18 01:22	72-43-5	
Toxaphene	ND	ug/kg	1300	20	03/26/18 07:27	04/04/18 01:22	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/26/18 07:27	04/04/18 01:22	877-09-8	3M, D3, S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID:** 10424609005 Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	0	%.	30-150	20	03/26/18 07:27	04/04/18 01:22	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11141-16-5	
PCB-1242 (Aroclor 1242)	247	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	12672-29-6	
PCB-1254 (Aroclor 1254)	174	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	11100-14-4	
PCB, Total	421	ug/kg	42.7	1	03/23/18 16:00	03/26/18 19:47	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%.	48-125	1	03/23/18 16:00	03/26/18 19:47	877-09-8	
Decachlorobiphenyl (S)	75	%.	30-134	1	03/23/18 16:00	03/26/18 19:47	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	745	mg/kg	232	20	03/26/18 14:27	03/27/18 20:54		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	03/26/18 14:27	03/27/18 20:54	638-68-6	S4
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	90.2	mg/kg	17.1	1	03/30/18 14:11	03/31/18 01:20		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	03/30/18 14:11	03/31/18 01:20	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7660	mg/kg	12.6	1	03/26/18 05:53	03/29/18 18:14	7429-90-5	
Barium	1510	mg/kg	0.63	1	03/26/18 05:53	03/29/18 18:14	7440-39-3	
Boron	99.3	mg/kg	9.5	1	03/26/18 05:53	03/29/18 18:14	7440-42-8	
Copper	207	mg/kg	0.63	1	03/26/18 05:53	03/29/18 18:14	7440-50-8	
Iron	28800	mg/kg	15.8	5	03/26/18 05:53	03/30/18 10:46	7439-89-6	
Manganese	1640	mg/kg	0.32	1	03/26/18 05:53	03/29/18 18:14	7439-96-5	
Nickel	65.8	mg/kg	1.3	1	03/26/18 05:53	03/29/18 18:14	7440-02-0	
Silver	ND	mg/kg	0.63	1	03/26/18 05:53	03/29/18 18:14	7440-22-4	
Tin	16.6	mg/kg	4.7	1	03/26/18 05:53	03/29/18 18:14	7440-31-5	
Titanium	410	mg/kg	1.6	1	03/26/18 05:53	03/29/18 18:14	7440-32-6	
Zinc	565	mg/kg	1.3	1	03/26/18 05:53	03/29/18 18:14	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	32.5	mg/kg	1.2	5	03/30/18 09:43	03/31/18 05:33	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID: 10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	2.1	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7440-36-0	
Arsenic	9.7	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7440-38-2	
Beryllium	0.96	mg/kg	0.25	20	03/26/18 09:32	04/02/18 12:30	7440-41-7	
Cadmium	1.3	mg/kg	0.10	20	03/26/18 09:32	04/02/18 12:30	7440-43-9	
Cobalt	7.3	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7440-48-4	
Lead	141	mg/kg	0.13	20	03/26/18 09:32	04/02/18 12:30	7439-92-1	
Lithium	8.4	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7439-93-2	
Selenium	2.2	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7782-49-2	
Strontium	50.7	mg/kg	0.63	20	03/26/18 09:32	04/02/18 12:30	7440-24-6	
Vanadium	50.3	mg/kg	1.3	20	03/26/18 09:32	04/02/18 12:30	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.21	mg/kg	0.022	1	03/30/18 08:32	03/30/18 11:44	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	23.0	%	0.10	1		03/26/18 14:27		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	83-32-9	
Acenaphthylene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	208-96-8	
Anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	120-12-7	
Benzo(a)anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	56-55-3	
Benzo(a)pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	101-55-3	
Butylbenzylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	85-68-7	
Carbazole	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	59-50-7	
4-Chloroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	108-60-1	
2-Chloronaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	91-58-7	
2-Chlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	7005-72-3	
Chrysene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	53-70-3	
Dibenzofuran	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	120-83-2	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: **FD-SB-E4-WM (3-21)** Lab ID: **10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Diethylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	105-67-9	
Dimethylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	131-11-3	
Di-n-butylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2210	1	03/27/18 12:47	03/31/18 19:05	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	606-20-2	
Di-n-octylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	117-81-7	
Fluoranthene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	206-44-0	
Fluorene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	87-68-3	
Hexachlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	118-74-1	
Hexachloroethane	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	193-39-5	
Isophorone	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	78-59-1	
1-Methylnaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	90-12-0	
2-Methylnaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	856	1	03/27/18 12:47	03/31/18 19:05		
Naphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	91-20-3	
2-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	88-74-4	
3-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	99-09-2	
4-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	100-01-6	
Nitrobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	98-95-3	
2-Nitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	88-75-5	
4-Nitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	86-30-6	
Pentachlorophenol	ND	ug/kg	869	1	03/27/18 12:47	03/31/18 19:05	87-86-5	
Phenanthrene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	85-01-8	
Phenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	108-95-2	
Pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/31/18 19:05	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%	43-125	1	03/27/18 12:47	03/31/18 19:05	4165-60-0	
2-Fluorobiphenyl (S)	65	%	30-132	1	03/27/18 12:47	03/31/18 19:05	321-60-8	
p-Terphenyl-d14 (S)	62	%	62-125	1	03/27/18 12:47	03/31/18 19:05	1718-51-0	
Phenol-d6 (S)	63	%	48-125	1	03/27/18 12:47	03/31/18 19:05	13127-88-3	
2-Fluorophenol (S)	51	%	40-125	1	03/27/18 12:47	03/31/18 19:05	367-12-4	
2,4,6-Tribromophenol (S)	38	%	60-125	1	03/27/18 12:47	03/31/18 19:05	118-79-6	S5

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID: 10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	267	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	83-32-9	
Acenaphthylene	134	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	208-96-8	
Anthracene	373	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	120-12-7	
Benzo(a)anthracene	701	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	56-55-3	
Benzo(a)pyrene	585	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	50-32-8	
Benzo(b)fluoranthene	584	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	205-99-2	
Benzo(g,h,i)perylene	413	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	191-24-2	
Benzo(k)fluoranthene	303	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	207-08-9	
Chrysene	660	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	53-70-3	
Fluoranthene	1410	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	206-44-0	
Fluorene	229	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	86-73-7	
Indeno(1,2,3-cd)pyrene	301	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	193-39-5	
Naphthalene	239	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	91-20-3	
Phenanthrene	996	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	85-01-8	
Pyrene	1410	ug/kg	130	10	03/26/18 11:34	03/27/18 21:36	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	10	03/26/18 11:34	03/27/18 21:36	321-60-8	D3,S4
p-Terphenyl-d14 (S)	0	%.	57-125	10	03/26/18 11:34	03/27/18 21:36	1718-51-0	S4
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	25057-89-0	
2,4-D	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	94-75-7	
2,4-DB	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	94-82-6	
Dicamba	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	1918-00-9	
Dinoseb	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	88-85-7	
MCPA	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	94-74-6	
Pentachlorophenol	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	87-86-5	
Picloram	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	1918-02-1	
2,4,5-T	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	93-72-1	
Triclopyr	ND	mg/kg	0.086	1	03/29/18 07:30	04/04/18 16:02	55335-06-3	
Surrogates								
2,4-DCAA (S)	64	%.	46-125	1	03/29/18 07:30	04/04/18 16:02	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1500	1	03/26/18 09:03	03/26/18 14:34	67-64-1	
Allyl chloride	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	107-05-1	
Benzene	211	ug/kg	30.0	1	03/26/18 09:03	03/26/18 14:34	71-43-2	
Bromobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	108-86-1	
Bromochloromethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	74-97-5	
Bromodichloromethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	75-27-4	
Bromoform	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	75-25-2	
Bromomethane	ND	ug/kg	750	1	03/26/18 09:03	03/26/18 14:34	74-83-9	
2-Butanone (MEK)	ND	ug/kg	375	1	03/26/18 09:03	03/26/18 14:34	78-93-3	
n-Butylbenzene	307	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID: 10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
sec-Butylbenzene	214	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	135-98-8	
tert-Butylbenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	98-06-6	
Carbon tetrachloride	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	56-23-5	
Chlorobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	108-90-7	
Chloroethane	ND	ug/kg	750	1	03/26/18 09:03	03/26/18 14:34	75-00-3	
Chloroform	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	67-66-3	
Chloromethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	74-87-3	
2-Chlorotoluene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	95-49-8	
4-Chlorotoluene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	750	1	03/26/18 09:03	03/26/18 14:34	96-12-8	
Dibromochloromethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	106-93-4	
Dibromomethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	74-95-3	
1,2-Dichlorobenzene	585	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	541-73-1	
1,4-Dichlorobenzene	192	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	75-71-8	
1,1-Dichloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	75-34-3	
1,2-Dichloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	107-06-2	
1,1-Dichloroethene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	156-60-5	
Dichlorofluoromethane	ND	ug/kg	750	1	03/26/18 09:03	03/26/18 14:34	75-43-4	
1,2-Dichloropropane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	78-87-5	
1,3-Dichloropropane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	142-28-9	
2,2-Dichloropropane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	594-20-7	
1,1-Dichloropropene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	60-29-7	
Ethylbenzene	639	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	375	1	03/26/18 09:03	03/26/18 14:34	87-68-3	
Isopropylbenzene (Cumene)	182	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	98-82-8	
p-Isopropyltoluene	140	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	99-87-6	
Methylene Chloride	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	375	1	03/26/18 09:03	03/26/18 14:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	1634-04-4	
Naphthalene	2500	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	91-20-3	
n-Propylbenzene	249	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	103-65-1	
Styrene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	630-20-6	
1,1,1,2,2-Tetrachloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	79-34-5	N2
Tetrachloroethene	125	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	127-18-4	
Tetrahydrofuran	ND	ug/kg	3000	1	03/26/18 09:03	03/26/18 14:34	109-99-9	
Toluene	302	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Sample: FD-SB-E4-WM (3-21) **Lab ID: 10424609005** Collected: 03/22/18 16:30 Received: 03/22/18 17:40 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,4-Trichlorobenzene	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	79-00-5	
Trichloroethene	82.5	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	300	1	03/26/18 09:03	03/26/18 14:34	76-13-1	
1,2,4-Trimethylbenzene	1060	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	95-63-6	
1,3,5-Trimethylbenzene	116	ug/kg	75.0	1	03/26/18 09:03	03/26/18 14:34	108-67-8	
Vinyl chloride	ND	ug/kg	30.0	1	03/26/18 09:03	03/26/18 14:34	75-01-4	
Xylene (Total)	545	ug/kg	225	1	03/26/18 09:03	03/26/18 14:34	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%.	75-125	1	03/26/18 09:03	03/26/18 14:34	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/26/18 09:03	03/26/18 14:34	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	03/26/18 09:03	03/26/18 14:34	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	26.1	10	03/30/18 14:00	04/03/18 11:35	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	32.5	mg/kg	1.0	1		04/05/18 08:57	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.18	1	03/29/18 10:55	03/29/18 13:13	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.9	mg/kg	0.99	1	03/29/18 15:45	03/30/18 23:31	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

QC Batch: 139779 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 553598 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/02/18 14:39	N3

METHOD BLANK: 553599 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/02/18 14:46	N3

METHOD BLANK: 553600 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.19	04/02/18 14:52	N3

LABORATORY CONTROL SAMPLE: 553601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	109	105	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553602 553603

Parameter	Units	10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	22.5	480	482	389	390	76	76	65-135	0	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553604 553605

Parameter	Units	10424609001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	1000	932	788	743	79	80	65-135	6	35	N3

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

QC Batch: 529815 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2875655 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	03/30/18 17:39	
a,a,a-Trifluorotoluene (S)	%	100	80-150	03/30/18 17:39	

LABORATORY CONTROL SAMPLE & LCSD: 2875656

Parameter	Units	2875657								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	46.3	44.7	93	89	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				99	99	80-150			

MATRIX SPIKE SAMPLE: 2876408

Parameter	Units	10424443005						
		Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers		
Gasoline Range Organics	mg/kg	ND	60.8	115	187	80-120	C0,M1	
a,a,a-Trifluorotoluene (S)	%				98	80-150		

SAMPLE DUPLICATE: 2876409

Parameter	Units	10424609003				
		Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	104	107	3	20	
a,a,a-Trifluorotoluene (S)	%	99	99	0		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529743 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2875322 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	03/30/18 10:50	

LABORATORY CONTROL SAMPLE: 2875323

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.51	115	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875635 2875636

Parameter	Units	10424609001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	1.5	1.5	1.7	1.6	110	109	80-120	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528915 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870798 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.8	03/29/18 17:03	
Barium	mg/kg	ND	0.49	03/29/18 17:03	
Boron	mg/kg	ND	7.4	03/29/18 17:03	
Copper	mg/kg	ND	0.49	03/29/18 17:03	
Iron	mg/kg	ND	2.5	03/29/18 17:03	
Manganese	mg/kg	ND	0.25	03/29/18 17:03	
Nickel	mg/kg	ND	0.98	03/29/18 17:03	
Silver	mg/kg	ND	0.49	03/29/18 17:03	
Tin	mg/kg	ND	3.7	03/29/18 17:03	
Titanium	mg/kg	ND	1.2	03/29/18 17:03	
Zinc	mg/kg	ND	0.98	03/29/18 17:03	

LABORATORY CONTROL SAMPLE: 2870799

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	980	929	95	80-120	
Barium	mg/kg	49	49.2	100	80-120	
Boron	mg/kg	49	46.3	94	80-120	
Copper	mg/kg	49	47.6	97	80-120	
Iron	mg/kg	980	964	98	80-120	
Manganese	mg/kg	49	49.0	100	80-120	
Nickel	mg/kg	49	48.2	98	80-120	
Silver	mg/kg	24.5	23.0	94	80-120	
Tin	mg/kg	49	49.7	101	80-120	
Titanium	mg/kg	49	48.8	100	80-120	
Zinc	mg/kg	49	48.1	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870800 2870801

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424443001 Result	Spike Conc.	Spike Conc.	Result							
Aluminum	mg/kg	11900	1370	1380	26800	10300	1090	-120	75-125	89	20	P6,R1
Barium	mg/kg	292	68.3	69	388	431	140	202	75-125	11	20	P6
Boron	mg/kg	26.6	68.3	69	122	132	140	152	75-125	7	20	M1
Copper	mg/kg	228	68.3	69	6980	1110	9880	1280	75-125	145	20	M6,R1
Iron	mg/kg	15900	1370	1380	60900	98200	3290	5960	75-125	47	20	M6,R1
Manganese	mg/kg	249	68.3	69	729	664	703	601	75-125	9	20	P6
Nickel	mg/kg	112	68.3	69	2360	141	3290	41	75-125	177	20	M6,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	2870800		2870801		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424443001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Silver	mg/kg	1.8	34.2	34.5	34.1	34.9	94	96	75-125	2	20		
Tin	mg/kg	186	68.3	69	237	238	74	76	75-125	1	20	M1	
Titanium	mg/kg	275	68.3	69	265	560	-14	413	75-125	71	20	M1, R1	
Zinc	mg/kg	86700	68.3	69	3680	9550	-121000	-112000	75-125	89	20	M6, R1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 434613 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2007430 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	03/31/18 04:29	N2

LABORATORY CONTROL SAMPLE: 2007431

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.6	97	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2007432 2007433

Parameter	Units	2007432		2007433		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424609003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	31.2	4.74	4.74	36.1	22.7	103	-179	75-125	46	20 1M, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528917 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870806 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	04/02/18 10:52	
Arsenic	mg/kg	ND	0.50	04/02/18 10:52	
Beryllium	mg/kg	ND	0.20	04/02/18 10:52	
Cadmium	mg/kg	ND	0.079	04/02/18 10:52	
Cobalt	mg/kg	ND	0.50	04/02/18 10:52	
Lead	mg/kg	ND	0.099	04/02/18 10:52	
Lithium	mg/kg	ND	0.50	04/02/18 10:52	
Selenium	mg/kg	ND	0.50	04/02/18 10:52	
Strontium	mg/kg	ND	0.50	04/02/18 10:52	
Vanadium	mg/kg	ND	0.99	04/02/18 10:52	

LABORATORY CONTROL SAMPLE: 2870807

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49.5	51.0	103	80-120	
Arsenic	mg/kg	49.5	50.2	101	80-120	
Beryllium	mg/kg	49.5	50.1	101	80-120	
Cadmium	mg/kg	49.5	51.4	104	80-120	
Cobalt	mg/kg	49.5	52.1	105	80-120	
Lead	mg/kg	49.5	51.3	104	80-120	
Lithium	mg/kg	49.5	50.5	102	80-120	
Selenium	mg/kg	49.5	49.8	101	80-120	
Strontium	mg/kg	49.5	51.6	104	80-120	
Vanadium	mg/kg	49.5	52.6	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870808 2870809

Parameter	Units	10424443001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Antimony	mg/kg	3.0	67	67.7	45.3	52.2	63	73	75-125	14	20	M6	
Arsenic	mg/kg	14.3	67	67.7	84.2	84.6	104	104	75-125	1	20		
Beryllium	mg/kg	0.36	67	67.7	67.8	70.7	101	104	75-125	4	20		
Cadmium	mg/kg	4.6	67	67.7	78.7	77.4	110	107	75-125	2	20		
Cobalt	mg/kg	37.4	67	67.7	80.0	109	63	106	75-125	31	20	M6,R1	
Lead	mg/kg	724	67	67.7	971	483	368	-356	75-125	67	20	M6,R1	
Lithium	mg/kg	6.7	67	67.7	74.4	78.1	101	105	75-125	5	20		
Selenium	mg/kg	0.82	67	67.7	64.9	71.0	96	104	75-125	9	20		
Strontium	mg/kg	106	67	67.7	182	192	114	127	75-125	5	20	M6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2870808		2870809								
Parameter	Units	10424443001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Vanadium	mg/kg	27.4	67	67.7	104	101	114	108	75-125	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528989 Analysis Method: ASTM D2974
 QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

SAMPLE DUPLICATE: 2871261

Parameter	Units	10424609001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	67.6	68.4	1	30	

SAMPLE DUPLICATE: 2871439

Parameter	Units	10424778006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	35.6	36.0	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528973 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2871002 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/26/18 10:56	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/26/18 10:56	
1,1-Dichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,1-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
1,1-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,3-Trichloropropane	ug/kg	ND	200	03/26/18 10:56	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/26/18 10:56	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichloroethane	ug/kg	ND	50.0	03/26/18 10:56	
1,2-Dichloropropane	ug/kg	ND	50.0	03/26/18 10:56	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
1,3-Dichloropropane	ug/kg	ND	50.0	03/26/18 10:56	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
2,2-Dichloropropane	ug/kg	ND	200	03/26/18 10:56	
2-Butanone (MEK)	ug/kg	ND	250	03/26/18 10:56	
2-Chlorotoluene	ug/kg	ND	50.0	03/26/18 10:56	
4-Chlorotoluene	ug/kg	ND	50.0	03/26/18 10:56	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/26/18 10:56	
Acetone	ug/kg	ND	1000	03/26/18 10:56	
Allyl chloride	ug/kg	ND	200	03/26/18 10:56	
Benzene	ug/kg	ND	20.0	03/26/18 10:56	
Bromobenzene	ug/kg	ND	50.0	03/26/18 10:56	
Bromochloromethane	ug/kg	ND	50.0	03/26/18 10:56	
Bromodichloromethane	ug/kg	ND	50.0	03/26/18 10:56	
Bromoform	ug/kg	ND	200	03/26/18 10:56	
Bromomethane	ug/kg	ND	500	03/26/18 10:56	
Carbon tetrachloride	ug/kg	ND	50.0	03/26/18 10:56	
Chlorobenzene	ug/kg	ND	50.0	03/26/18 10:56	
Chloroethane	ug/kg	ND	500	03/26/18 10:56	
Chloroform	ug/kg	ND	50.0	03/26/18 10:56	
Chloromethane	ug/kg	ND	200	03/26/18 10:56	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

METHOD BLANK: 2871002 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/26/18 10:56	
Dibromomethane	ug/kg	ND	50.0	03/26/18 10:56	
Dichlorodifluoromethane	ug/kg	ND	200	03/26/18 10:56	
Dichlorofluoromethane	ug/kg	ND	500	03/26/18 10:56	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/26/18 10:56	
Ethylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/26/18 10:56	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/26/18 10:56	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/26/18 10:56	
Methylene Chloride	ug/kg	ND	200	03/26/18 10:56	
n-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
n-Propylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Naphthalene	ug/kg	ND	200	03/26/18 10:56	
p-Isopropyltoluene	ug/kg	ND	50.0	03/26/18 10:56	
sec-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Styrene	ug/kg	ND	50.0	03/26/18 10:56	
tert-Butylbenzene	ug/kg	ND	50.0	03/26/18 10:56	
Tetrachloroethene	ug/kg	ND	50.0	03/26/18 10:56	
Tetrahydrofuran	ug/kg	ND	2000	03/26/18 10:56	
Toluene	ug/kg	ND	50.0	03/26/18 10:56	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/26/18 10:56	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/26/18 10:56	
Trichloroethene	ug/kg	ND	50.0	03/26/18 10:56	N2
Trichlorofluoromethane	ug/kg	ND	200	03/26/18 10:56	
Vinyl chloride	ug/kg	ND	20.0	03/26/18 10:56	
Xylene (Total)	ug/kg	ND	150	03/26/18 10:56	
1,2-Dichloroethane-d4 (S)	%	90	75-125	03/26/18 10:56	
4-Bromofluorobenzene (S)	%	99	75-125	03/26/18 10:56	
Toluene-d8 (S)	%	98	75-125	03/26/18 10:56	

LABORATORY CONTROL SAMPLE & LCSD: 2871003

Parameter	Units	2871004							Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD		
1,1,1,2-Tetrachloroethane	ug/kg	1000	828	958	83	96	59-125	15	20	
1,1,1-Trichloroethane	ug/kg	1000	802	933	80	93	59-125	15	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	803	971	80	97	58-125	19	20	N2
1,1,2-Trichloroethane	ug/kg	1000	778	897	78	90	64-125	14	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	776	922	78	92	65-125	17	20	
1,1-Dichloroethane	ug/kg	1000	754	861	75	86	63-125	13	20	
1,1-Dichloroethene	ug/kg	1000	790	968	79	97	59-125	20	20	
1,1-Dichloropropene	ug/kg	1000	799	946	80	95	64-125	17	20	
1,2,3-Trichlorobenzene	ug/kg	1000	776	965	78	97	55-126	22	20	R1
1,2,3-Trichloropropane	ug/kg	1000	736	872	74	87	62-125	17	20	
1,2,4-Trichlorobenzene	ug/kg	1000	804	961	80	96	62-125	18	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE & LCSD: 2871003		2871004								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	793	931	79	93	59-125	16	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1890	2200	76	88	54-125	15	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	781	899	78	90	64-125	14	20	
1,2-Dichlorobenzene	ug/kg	1000	765	890	76	89	63-125	15	20	
1,2-Dichloroethane	ug/kg	1000	684	807	68	81	57-125	17	20	
1,2-Dichloropropane	ug/kg	1000	779	896	78	90	67-125	14	20	
1,3,5-Trimethylbenzene	ug/kg	1000	811	936	81	94	59-125	14	20	
1,3-Dichlorobenzene	ug/kg	1000	738	884	74	88	64-125	18	20	
1,3-Dichloropropane	ug/kg	1000	757	878	76	88	64-125	15	20	
1,4-Dichlorobenzene	ug/kg	1000	766	874	77	87	63-125	13	20	
2,2-Dichloropropane	ug/kg	1000	860	973	86	97	37-126	12	20	
2-Butanone (MEK)	ug/kg	5000	3740	4230	75	85	48-125	12	20	
2-Chlorotoluene	ug/kg	1000	777	890	78	89	62-125	13	20	
4-Chlorotoluene	ug/kg	1000	763	893	76	89	63-125	16	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3630	4290	73	86	52-135	17	20	
Acetone	ug/kg	5000	5390	6150	108	123	65-125	13	20	
Allyl chloride	ug/kg	1000	747	873	75	87	52-125	16	20	
Benzene	ug/kg	1000	765	859	76	86	61-125	12	20	
Bromobenzene	ug/kg	1000	794	916	79	92	64-125	14	20	
Bromochloromethane	ug/kg	1000	791	915	79	91	65-125	15	20	
Bromodichloromethane	ug/kg	1000	832	969	83	97	57-125	15	20	
Bromoform	ug/kg	1000	784	903	78	90	57-125	14	20	
Bromomethane	ug/kg	1000	777	845	78	85	60-125	8	20	
Carbon tetrachloride	ug/kg	1000	848	960	85	96	58-125	12	20	
Chlorobenzene	ug/kg	1000	782	883	78	88	66-125	12	20	
Chloroethane	ug/kg	1000	825	870	83	87	62-125	5	20	
Chloroform	ug/kg	1000	701	786	70	79	59-125	11	20	
Chloromethane	ug/kg	1000	733	791	73	79	50-125	8	20	
cis-1,2-Dichloroethene	ug/kg	1000	761	895	76	89	61-125	16	20	
cis-1,3-Dichloropropene	ug/kg	1000	794	937	79	94	61-125	17	20	
Dibromochloromethane	ug/kg	1000	790	890	79	89	60-125	12	20	
Dibromomethane	ug/kg	1000	808	948	81	95	69-125	16	20	
Dichlorodifluoromethane	ug/kg	1000	672	702	67	70	38-125	4	20	
Dichlorofluoromethane	ug/kg	1000	765	803	76	80	67-125	5	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1390	1250	139	125	60-125	11	20 L3	
Ethylbenzene	ug/kg	1000	775	906	78	91	62-125	16	20	
Hexachloro-1,3-butadiene	ug/kg	1000	810	968	81	97	56-125	18	20	
Isopropylbenzene (Cumene)	ug/kg	1000	836	962	84	96	65-125	14	20	
Methyl-tert-butyl ether	ug/kg	1000	731	855	73	86	59-125	16	20	
Methylene Chloride	ug/kg	1000	774	888	77	89	64-125	14	20	
n-Butylbenzene	ug/kg	1000	802	976	80	98	59-125	20	20	
n-Propylbenzene	ug/kg	1000	808	931	81	93	61-125	14	20	
Naphthalene	ug/kg	1000	818	982	82	98	53-125	18	20	
p-Isopropyltoluene	ug/kg	1000	794	949	79	95	63-125	18	20	
sec-Butylbenzene	ug/kg	1000	819	960	82	96	62-125	16	20	
Styrene	ug/kg	1000	816	950	82	95	66-125	15	20	
tert-Butylbenzene	ug/kg	1000	806	939	81	94	64-125	15	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	2871003		2871004			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Tetrachloroethene	ug/kg	1000	810	941	81	94	67-125	15	20	
Tetrahydrofuran	ug/kg	10000	11200	12700	112	127	62-125	12	20	L3
Toluene	ug/kg	1000	798	905	80	91	61-125	13	20	
trans-1,2-Dichloroethene	ug/kg	1000	807	948	81	95	64-125	16	20	
trans-1,3-Dichloropropene	ug/kg	1000	809	946	81	95	56-125	16	20	
Trichloroethene	ug/kg	1000	767	896	77	90	67-125	15	20	N2
Trichlorofluoromethane	ug/kg	1000	782	818	78	82	65-125	5	20	
Vinyl chloride	ug/kg	1000	805	843	81	84	57-125	5	20	
Xylene (Total)	ug/kg	3000	2420	2790	81	93	62-125	14	20	
1,2-Dichloroethane-d4 (S)	%				91	91	75-125			
4-Bromofluorobenzene (S)	%				101	100	75-125			
Toluene-d8 (S)	%				99	98	75-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528957 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870967 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/03/18 20:29	
4,4'-DDE	ug/kg	ND	3.3	04/03/18 20:29	
4,4'-DDT	ug/kg	ND	3.3	04/03/18 20:29	
Aldrin	ug/kg	ND	1.7	04/03/18 20:29	
alpha-BHC	ug/kg	ND	1.7	04/03/18 20:29	
alpha-Chlordane	ug/kg	ND	1.7	04/03/18 20:29	
beta-BHC	ug/kg	ND	1.7	04/03/18 20:29	
Chlordane (Technical)	ug/kg	ND	16.7	04/03/18 20:29	
delta-BHC	ug/kg	ND	1.7	04/03/18 20:29	
Dieldrin	ug/kg	ND	3.3	04/03/18 20:29	
Endosulfan I	ug/kg	ND	1.7	04/03/18 20:29	
Endosulfan II	ug/kg	ND	3.3	04/03/18 20:29	
Endosulfan sulfate	ug/kg	ND	3.3	04/03/18 20:29	
Endrin	ug/kg	ND	3.3	04/03/18 20:29	
Endrin aldehyde	ug/kg	ND	3.3	04/03/18 20:29	
Endrin ketone	ug/kg	ND	3.3	04/03/18 20:29	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/03/18 20:29	
gamma-Chlordane	ug/kg	ND	1.7	04/03/18 20:29	
Heptachlor	ug/kg	ND	1.7	04/03/18 20:29	
Heptachlor epoxide	ug/kg	ND	1.7	04/03/18 20:29	
Methoxychlor	ug/kg	ND	16.7	04/03/18 20:29	
Toxaphene	ug/kg	ND	50.0	04/03/18 20:29	
Decachlorobiphenyl (S)	%	89	30-150	04/03/18 20:29	
Tetrachloro-m-xylene (S)	%	95	30-150	04/03/18 20:29	

LABORATORY CONTROL SAMPLE: 2870968

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	36.7	110	62-127	
4,4'-DDE	ug/kg	33.3	36.5	110	66-125	
4,4'-DDT	ug/kg	33.3	38.7	116	67-128	
Aldrin	ug/kg	16.7	16.5	99	66-125	
alpha-BHC	ug/kg	16.7	16.8	101	64-125	
alpha-Chlordane	ug/kg	16.7	16.9	102	68-125	
beta-BHC	ug/kg	16.7	17.1	103	69-125	
delta-BHC	ug/kg	16.7	10.8	65	42-133	
Dieldrin	ug/kg	33.3	37.4	112	69-126	
Endosulfan I	ug/kg	16.7	15.5	93	63-125	
Endosulfan II	ug/kg	33.3	36.0	108	69-125	
Endosulfan sulfate	ug/kg	33.3	30.0	90	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE: 2870968

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	34.6	104	69-125	
Endrin aldehyde	ug/kg	33.3	34.2	103	65-125	
Endrin ketone	ug/kg	33.3	36.6	110	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	17.3	104	67-125	
gamma-Chlordane	ug/kg	16.7	15.4	93	63-125	
Heptachlor	ug/kg	16.7	18.1	108	69-125	
Heptachlor epoxide	ug/kg	16.7	17.2	103	68-125	
Methoxychlor	ug/kg	167	189	114	65-134	
Decachlorobiphenyl (S)	%			94	30-150	
Tetrachloro-m-xylene (S)	%			104	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2871047 2871048

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424609004 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	43.9	43.9	68.1J	70.1J	155	159	56-125	20	M6
4,4'-DDE	ug/kg	ND	43.9	43.9	58.9J	59J	134	134	32-150	20	
4,4'-DDT	ug/kg	ND	43.9	43.9	54.9J	51.6J	125	117	60-132	20	
Aldrin	ug/kg	ND	22	22	33.3J	32J	151	146	56-125	20	M6
alpha-BHC	ug/kg	ND	22	22	24.9J	30.5J	114	139	54-136	20	M6
alpha-Chlordane	ug/kg	ND	22	22	22.2J	20.5J	101	93	54-133	20	
beta-BHC	ug/kg	ND	22	22	39.4J	39.3J	179	179	30-150	20	M6
delta-BHC	ug/kg	ND	22	22	18.1J	17.2J	82	78	45-145	20	
Dieldrin	ug/kg	ND	43.9	43.9	79.1J	65.5J	180	149	47-150	20	M6
Endosulfan I	ug/kg	ND	22	22	37J	33.1J	169	151	35-145	20	M6
Endosulfan II	ug/kg	ND	43.9	43.9	50.1J	50.9J	114	116	50-147	20	
Endosulfan sulfate	ug/kg	ND	43.9	43.9	43.1J	41.2J	98	94	54-132	20	
Endrin	ug/kg	ND	43.9	43.9	7.4J	48.7J	17	111	62-125	20	M6
Endrin aldehyde	ug/kg	ND	43.9	43.9	58.9J	69J	134	157	33-150	20	M6
Endrin ketone	ug/kg	ND	43.9	43.9	50.9J	53.6J	116	122	56-144	20	
gamma-BHC (Lindane)	ug/kg	ND	22	22	27.3J	27.6J	124	126	63-125	20	M6
gamma-Chlordane	ug/kg	ND	22	22	39.2J	38.8J	179	176	45-132	20	M6
Heptachlor	ug/kg	ND	22	22	27.3J	34.4J	124	157	51-142	20	M6
Heptachlor epoxide	ug/kg	ND	22	22	20.6J	21.9J	94	100	50-142	20	
Methoxychlor	ug/kg	ND	220	220	255J	252J	116	114	58-139	20	
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		3M, D3, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528834 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870017 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	03/26/18 16:38	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	03/26/18 16:38	
Decachlorobiphenyl (S)	%.	87	30-134	03/26/18 16:38	
Tetrachloro-m-xylene (S)	%.	82	48-125	03/26/18 16:38	

LABORATORY CONTROL SAMPLE: 2870018

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	562	84	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	571	86	62-125	
Decachlorobiphenyl (S)	%.			89	30-134	
Tetrachloro-m-xylene (S)	%.			86	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870019 2870020

Parameter	Units	10424607001		2870019		2870020		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result						
PCB-1016 (Aroclor 1016)	ug/kg	ND	847	847	459	692	54	82	30-150	40	30	R1	
PCB-1260 (Aroclor 1260)	ug/kg	ND	847	847	460	699	54	82	30-138	41	30	R1	
Decachlorobiphenyl (S)	%.						56	81	30-134				
Tetrachloro-m-xylene (S)	%.						59	87	48-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529268 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2872570 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Diphenylhydrazine	ug/kg	ND	330	03/30/18 11:47	
1,3-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,4-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2,4,5-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dimethylphenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2,6-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2-Chloronaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Chlorophenol	ug/kg	ND	330	03/30/18 11:47	
2-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	03/30/18 11:47	
2-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
2-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	03/30/18 11:47	
3,3'-Dichlorobenzidine	ug/kg	ND	330	03/30/18 11:47	
3-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	03/30/18 11:47	
4-Bromophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Chloro-3-methylphenol	ug/kg	ND	330	03/30/18 11:47	
4-Chloroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Chlorophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
Acenaphthene	ug/kg	ND	330	03/30/18 11:47	
Acenaphthylene	ug/kg	ND	330	03/30/18 11:47	
Anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)pyrene	ug/kg	ND	330	03/30/18 11:47	
Benzo(b)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Benzo(g,h,i)perylene	ug/kg	ND	330	03/30/18 11:47	
Benzo(k)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	03/30/18 11:47	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

METHOD BLANK: 2872570

Matrix: Solid

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	03/30/18 11:47	
Carbazole	ug/kg	ND	330	03/30/18 11:47	
Chrysene	ug/kg	ND	330	03/30/18 11:47	
Di-n-butylphthalate	ug/kg	ND	330	03/30/18 11:47	
Di-n-octylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dibenz(a,h)anthracene	ug/kg	ND	330	03/30/18 11:47	
Dibenzofuran	ug/kg	ND	330	03/30/18 11:47	
Diethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dimethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Fluorene	ug/kg	ND	330	03/30/18 11:47	
Hexachloro-1,3-butadiene	ug/kg	ND	330	03/30/18 11:47	
Hexachlorobenzene	ug/kg	ND	330	03/30/18 11:47	
Hexachloroethane	ug/kg	ND	330	03/30/18 11:47	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	03/30/18 11:47	
Isophorone	ug/kg	ND	330	03/30/18 11:47	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodimethylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodiphenylamine	ug/kg	ND	330	03/30/18 11:47	
Naphthalene	ug/kg	ND	330	03/30/18 11:47	
Nitrobenzene	ug/kg	ND	330	03/30/18 11:47	
Pentachlorophenol	ug/kg	ND	670	03/30/18 11:47	
Phenanthrene	ug/kg	ND	330	03/30/18 11:47	
Phenol	ug/kg	ND	330	03/30/18 11:47	
Pyrene	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Tribromophenol (S)	%	73	60-125	03/30/18 11:47	
2-Fluorobiphenyl (S)	%	58	30-132	03/30/18 11:47	
2-Fluorophenol (S)	%	55	40-125	03/30/18 11:47	
Nitrobenzene-d5 (S)	%	54	43-125	03/30/18 11:47	
p-Terphenyl-d14 (S)	%	90	62-125	03/30/18 11:47	
Phenol-d6 (S)	%	56	48-125	03/30/18 11:47	

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1020	61	46-125	
1,2-Dichlorobenzene	ug/kg	1670	999	60	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1310	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1010	61	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1010	61	39-125	
1-Methylnaphthalene	ug/kg	1670	1080	65	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1220	73	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1200	72	61-125	
2,4-Dichlorophenol	ug/kg	1670	1060	64	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1030	62	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1250	75	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1240	74	63-125	
2-Chloronaphthalene	ug/kg	1670	1130	68	61-125	
2-Chlorophenol	ug/kg	1670	1020	61	46-125	
2-Methylnaphthalene	ug/kg	1670	1080	65	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1080	65	50-125	
2-Nitroaniline	ug/kg	1670	1380	83	61-125	
2-Nitrophenol	ug/kg	1670	1030	62	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1080	65	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1290	78	47-125	
3-Nitroaniline	ug/kg	1670	1220	73	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1380J	83	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1350	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1180	71	64-125	
4-Chloroaniline	ug/kg	1670	944	57	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1210	73	64-125	
4-Nitroaniline	ug/kg	1670	1180	71	59-125	
4-Nitrophenol	ug/kg	1670	1320	79	54-125	
Acenaphthene	ug/kg	1670	1190	72	62-125	
Acenaphthylene	ug/kg	1670	1140	69	61-125	
Anthracene	ug/kg	1670	1280	77	66-125	
Benzo(a)anthracene	ug/kg	1670	1300	78	69-125	
Benzo(a)pyrene	ug/kg	1670	1310	79	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1380	83	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1320	79	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1300	78	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1120	67	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1090	65	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1180	71	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1330	80	69-131	
Butylbenzylphthalate	ug/kg	1670	1340	81	69-129	
Carbazole	ug/kg	1670	1290	77	66-125	
Chrysene	ug/kg	1670	1300	78	68-125	
Di-n-butylphthalate	ug/kg	1670	1360	81	69-125	
Di-n-octylphthalate	ug/kg	1670	1310	79	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1340	81	64-125	
Dibenzofuran	ug/kg	1670	1200	72	65-125	
Diethylphthalate	ug/kg	1670	1280	77	67-125	
Dimethylphthalate	ug/kg	1670	1240	75	67-125	
Fluoranthene	ug/kg	1670	1280	77	66-125	
Fluorene	ug/kg	1670	1190	71	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1040	62	40-125	
Hexachlorobenzene	ug/kg	1670	1320	79	62-125	
Hexachloroethane	ug/kg	1670	1010	61	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1320	79	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1130	68	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1150	69	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1090	65	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1320	79	65-125	
Naphthalene	ug/kg	1670	1050	63	48-125	
Nitrobenzene	ug/kg	1670	1130	68	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1300	78	66-125	
Phenol	ug/kg	1670	1110	67	46-125	
Pyrene	ug/kg	1670	1360	82	69-125	
2,4,6-Tribromophenol (S)	%			85	60-125	
2-Fluorobiphenyl (S)	%			76	30-132	
2-Fluorophenol (S)	%			69	40-125	
Nitrobenzene-d5 (S)	%			71	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			72	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788 2872789

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424792001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	1720	1710	1460J	1420J	85	83	30-127		30	
1,2-Dichlorobenzene	ug/kg	ND	1720	1710	1360J	1370J	79	80	30-125		30	
1,2-Diphenylhydrazine	ug/kg	ND	1720	1710	1710	1620J	100	95	30-150		30	
1,3-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1320J	82	77	30-125		30	
1,4-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1350J	82	79	30-125		30	
1-Methylnaphthalene	ug/kg	ND	1720	1710	1540J	1510J	90	88	42-125		30	
2,4,5-Trichlorophenol	ug/kg	ND	1720	1710	1470J	1350J	86	79	30-150		30	
2,4,6-Trichlorophenol	ug/kg	ND	1720	1710	1330J	1320J	78	77	30-150		30	
2,4-Dichlorophenol	ug/kg	ND	1720	1710	1550J	1480J	91	87	30-135		30	
2,4-Dimethylphenol	ug/kg	ND	1720	1710	1440J	1430J	84	84	30-148		30	
2,4-Dinitrophenol	ug/kg	ND	1720	1710	ND	ND	5	4	30-125		30	M1
2,4-Dinitrotoluene	ug/kg	ND	1720	1710	1560J	1560J	91	92	30-150		30	
2,6-Dinitrotoluene	ug/kg	ND	1720	1710	1650J	1720	96	100	30-150		30	
2-Chloronaphthalene	ug/kg	ND	1720	1710	1580J	1500J	92	88	30-138		30	
2-Chlorophenol	ug/kg	ND	1720	1710	1500J	1450J	88	85	30-130		30	
2-Methylnaphthalene	ug/kg	ND	1720	1710	1530J	1640J	89	96	46-125		30	
2-Methylphenol(o-Cresol)	ug/kg	ND	1720	1710	1590J	1490J	93	87	30-133		30	
2-Nitroaniline	ug/kg	ND	1720	1710	1650J	1750	97	103	30-150		30	
2-Nitrophenol	ug/kg	ND	1720	1710	1360J	1410J	79	83	30-134		30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1720	1710	1600J	1590J	94	93	30-138		30	
3,3'-Dichlorobenzidine	ug/kg	ND	1720	1710	1340J	1500J	78	88	30-149		30	6M
3-Nitroaniline	ug/kg	ND	1720	1710	1300J	1180J	76	69	30-150		30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1720	1710	ND	ND	19	20	30-133		30	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788			2872789										
Parameter	Units	10424792001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
4-Bromophenylphenyl ether	ug/kg	ND	1720	1710	1670J	1600J	97	94	44-125				30
4-Chloro-3-methylphenol	ug/kg	ND	1720	1710	1580J	ND	92	99	30-150				30
4-Chloroaniline	ug/kg	ND	1720	1710	1010J	930J	59	54	30-125				30
4-Chlorophenylphenyl ether	ug/kg	ND	1720	1710	1630J	1540J	95	90	44-125				30
4-Nitroaniline	ug/kg	ND	1720	1710	1500J	1440J	87	84	30-150				30
4-Nitrophenol	ug/kg	ND	1720	1710	1450J	1370J	85	80	30-150				30
Acenaphthene	ug/kg	ND	1720	1710	1490J	1430J	87	84	40-125				30
Acenaphthylene	ug/kg	ND	1720	1710	1560J	1470J	91	86	30-150				30
Anthracene	ug/kg	ND	1720	1710	1770	1800	103	106	30-150	2			30
Benzo(a)anthracene	ug/kg	ND	1720	1710	1970	1970	115	115	30-150	0			30
Benzo(a)pyrene	ug/kg	ND	1720	1710	1860	1850	109	108	30-150	1			30
Benzo(b)fluoranthene	ug/kg	ND	1720	1710	1560J	1770	91	104	30-150				30
Benzo(g,h,i)perylene	ug/kg	ND	1720	1710	1600J	1710	93	100	30-150				30
Benzo(k)fluoranthene	ug/kg	ND	1720	1710	1660J	1550J	97	91	30-150				30
bis(2-Chloroethoxy)methane	ug/kg	ND	1720	1710	1520J	1460J	89	85	30-134				30
bis(2-Chloroethyl) ether	ug/kg	ND	1720	1710	1570J	1550J	91	91	30-125				30 6M
bis(2-Chloroisopropyl) ether	ug/kg	ND	1720	1710	1780	1600J	104	94	30-125				30 6M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1720	1710	1780	1880	104	110	30-150	5			30
Butylbenzylphthalate	ug/kg	ND	1720	1710	1740	1790	102	105	30-150	3			30
Carbazole	ug/kg	ND	1720	1710	1660J	1710	97	100	41-125				30
Chrysene	ug/kg	ND	1720	1710	2070	2030	121	119	30-150	2			30
Di-n-butylphthalate	ug/kg	ND	1720	1710	1730	1740	101	102	30-150	0			30
Di-n-octylphthalate	ug/kg	ND	1720	1710	1840	1870	108	110	30-150	2			30
Dibenz(a,h)anthracene	ug/kg	ND	1720	1710	1540J	1680J	90	98	30-150				30
Dibenzofuran	ug/kg	ND	1720	1710	1620J	1590J	95	93	45-125				30
Diethylphthalate	ug/kg	ND	1720	1710	1680J	1660J	98	97	30-150				30
Dimethylphthalate	ug/kg	ND	1720	1710	1650J	1630J	97	96	30-150				30
Fluoranthene	ug/kg	ND	1720	1710	1750	1740	102	102	30-150	0			30
Fluorene	ug/kg	ND	1720	1710	1620J	1660J	95	97	30-150				30
Hexachloro-1,3-butadiene	ug/kg	ND	1720	1710	1380J	1460J	80	86	30-128				30
Hexachlorobenzene	ug/kg	ND	1720	1710	1500J	1500J	87	88	30-150				30
Hexachloroethane	ug/kg	ND	1720	1710	1440J	1350J	84	79	30-125				30
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1720	1710	1500J	1650J	88	97	30-150				30
Isophorone	ug/kg	ND	1720	1710	1570J	1550J	92	91	30-140				30
N-Nitroso-di-n-propylamine	ug/kg	ND	1720	1710	1680J	1570J	98	92	30-147				30 6M
N-Nitrosodimethylamine	ug/kg	ND	1720	1710	1420J	1330J	83	78	30-125				30
N-Nitrosodiphenylamine	ug/kg	ND	1720	1710	1610J	1720	94	101	30-150				30
Naphthalene	ug/kg	ND	1720	1710	1520J	1480J	89	86	44-125				30
Nitrobenzene	ug/kg	ND	1720	1710	1580J	1550J	92	91	30-136				30
Pentachlorophenol	ug/kg	ND	1720	1710	ND	ND	23	22	30-150				30 M1
Phenanthrene	ug/kg	ND	1720	1710	1890	1950	110	114	30-150	3			30
Phenol	ug/kg	ND	1720	1710	1530J	1490J	89	87	30-129				30
Pyrene	ug/kg	ND	1720	1710	2160	2260	126	132	30-150	4			30
2,4,6-Tribromophenol (S)	%						86	83	60-125				
2-Fluorobiphenyl (S)	%						98	95	30-132				
2-Fluorophenol (S)	%						95	88	40-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	2872788		2872789		MS % Rec	MSD % Rec	% Rec	Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Nitrobenzene-d5 (S)	%.	10424792001				93	93	43-125				
p-Terphenyl-d14 (S)	%.					97	103	62-125				
Phenol-d6 (S)	%.					95	93	48-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 528955 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2870959 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	03/27/18 13:28	
Acenaphthylene	ug/kg	ND	10.0	03/27/18 13:28	
Anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(a)anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(a)pyrene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(b)fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	03/27/18 13:28	
Benzo(k)fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Chrysene	ug/kg	ND	10.0	03/27/18 13:28	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	03/27/18 13:28	
Fluoranthene	ug/kg	ND	10.0	03/27/18 13:28	
Fluorene	ug/kg	ND	10.0	03/27/18 13:28	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	03/27/18 13:28	
Naphthalene	ug/kg	ND	10.0	03/27/18 13:28	
Phenanthrene	ug/kg	ND	10.0	03/27/18 13:28	
Pyrene	ug/kg	ND	10.0	03/27/18 13:28	
2-Fluorobiphenyl (S)	%	78	42-125	03/27/18 13:28	
p-Terphenyl-d14 (S)	%	87	57-125	03/27/18 13:28	

LABORATORY CONTROL SAMPLE: 2870960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	22.8	68	52-125	
Acenaphthylene	ug/kg	33.3	24.9	75	50-125	
Anthracene	ug/kg	33.3	29.1	87	65-125	
Benzo(a)anthracene	ug/kg	33.3	30.7	92	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.7	92	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.4	94	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	24.5	73	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	27.4	82	67-125	
Chrysene	ug/kg	33.3	28.3	85	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	22.8	68	63-125	
Fluoranthene	ug/kg	33.3	30.9	93	75-125	
Fluorene	ug/kg	33.3	23.1	69	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	23.9	72	63-125	
Naphthalene	ug/kg	33.3	25.1	75	49-125	
Phenanthrene	ug/kg	33.3	23.8	71	65-125	
Pyrene	ug/kg	33.3	29.6	89	64-125	
2-Fluorobiphenyl (S)	%			73	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	2871138		2871139		MS % Rec	MSD % Rec	% Rec	Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Acenaphthene	ug/kg	ND	34.2	34.2	22.3	22.6	65	66	30-125	1	30
Acenaphthylene	ug/kg	ND	34.2	34.2	23.2	23.2	68	68	30-133	0	30
Anthracene	ug/kg	ND	34.2	34.2	28.2	26.5	83	77	30-150	6	30
Benzo(a)anthracene	ug/kg	ND	34.2	34.2	28.8	28.3	84	83	30-150	2	30
Benzo(a)pyrene	ug/kg	ND	34.2	34.2	29.2	28.1	85	82	30-150	4	30
Benzo(b)fluoranthene	ug/kg	ND	34.2	34.2	27.5	27.1	80	79	30-150	1	30
Benzo(g,h,i)perylene	ug/kg	ND	34.2	34.2	28.6	27.6	84	81	30-150	4	30
Benzo(k)fluoranthene	ug/kg	ND	34.2	34.2	25.8	24.0	75	70	30-150	7	30
Chrysene	ug/kg	ND	34.2	34.2	27.3	26.0	80	76	30-150	5	30
Dibenz(a,h)anthracene	ug/kg	ND	34.2	34.2	23.7	23.3	69	68	30-131	2	30
Fluoranthene	ug/kg	ND	34.2	34.2	28.6	27.7	84	81	30-150	3	30
Fluorene	ug/kg	ND	34.2	34.2	24.0	22.4	70	66	30-147	7	30
Indeno(1,2,3-cd)pyrene	ug/kg	ND	34.2	34.2	26.5	25.3	78	74	30-150	5	30
Naphthalene	ug/kg	ND	34.2	34.2	21.6	22.6	63	66	30-131	4	30
Phenanthrene	ug/kg	ND	34.2	34.2	23.6	22.8	69	67	30-150	3	30
Pyrene	ug/kg	ND	34.2	34.2	28.6	27.3	84	80	30-150	5	30
2-Fluorobiphenyl (S)	%.						66	65	42-125		
p-Terphenyl-d14 (S)	%.						82	81	57-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529569 Analysis Method: EPA 8270D
QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2874519 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 13:35	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 13:35	
2,4-D	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DB	mg/kg	ND	0.033	04/04/18 13:35	
Bentazon	mg/kg	ND	0.033	04/04/18 13:35	
Dicamba	mg/kg	ND	0.033	04/04/18 13:35	
Dinoseb	mg/kg	ND	0.033	04/04/18 13:35	
MCPA	mg/kg	ND	0.033	04/04/18 13:35	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 13:35	
Picloram	mg/kg	ND	0.033	04/04/18 13:35	
Triclopyr	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DCAA (S)	%	78	46-125	04/04/18 13:35	

LABORATORY CONTROL SAMPLE: 2874520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.28	83	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	79	61-125	
2,4-D	mg/kg	.33	0.29	86	63-125	
2,4-DB	mg/kg	.33	0.28	83	59-125	
Bentazon	mg/kg	.33	0.25	76	58-125	
Dicamba	mg/kg	.33	0.27	80	52-125	
Dinoseb	mg/kg	.33	0.18	53	35-126	
MCPA	mg/kg	.33	0.27	82	57-125	
Pentachlorophenol	mg/kg	.33	0.21	63	48-125	
Picloram	mg/kg	.33	0.24	72	47-125	
Triclopyr	mg/kg	.33	0.28	83	68-125	
2,4-DCAA (S)	%			77	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521 2874522

Parameter	Units	10425111006		2874522		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
2,4,5-T	mg/kg	ND	.45	.45	0.19	0.21	42	45	30-145	8	20	
2,4,5-TP (Silvex)	mg/kg	ND	.45	.45	0.28	0.26	63	58	30-130	7	20	
2,4-D	mg/kg	ND	.45	.45	0.18	0.20	40	44	30-150	9	20	
2,4-DB	mg/kg	ND	.45	.45	0.35	0.33	77	72	45-126	7	20	
Bentazon	mg/kg	ND	.45	.45	0.33	0.32	73	71	30-133	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521		2874522		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10425111006 Result	MS Spike Conc.	MSD Spike Conc.									
Dicamba	mg/kg	ND	.45	.45	0.13	0.17	29	38	30-140	28	20	M1, R1	
Dinoseb	mg/kg	ND	.45	.45	0.39	0.31	86	69	30-136	23	20	R1	
MCPA	mg/kg	ND	.45	.45	0.24	0.22	53	49	30-136	9	20		
Pentachlorophenol	mg/kg	ND	.45	.45	0.28	0.25	63	55	44-125	13	20		
Picloram	mg/kg	ND	.45	.45	.016J	0.098	3	22	30-125		20	M1	
Triclopyr	mg/kg	ND	.45	.45	0.23	0.22	51	50	30-149	3	20		
2,4-DCAA (S)	%.						65	60	46-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch:	529084	Analysis Method:	WI MOD DRO
QC Batch Method:	WI MOD DRO	Analysis Description:	WIDRO GCS
Associated Lab Samples:	10424609005		

METHOD BLANK: 2871419 Matrix: Solid

Associated Lab Samples: 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/27/18 20:40	
n-Triacontane (S)	%.	89	50-150	03/27/18 20:40	

LABORATORY CONTROL SAMPLE & LCSD: 2871420

2871421

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	79.1	72.1	99	90	70-120	9	20	
n-Triacontane (S)	%.				91	89	50-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 529461 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004

METHOD BLANK: 2873677 Matrix: Solid

Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/29/18 10:21	
n-Triacontane (S)	%.	80	50-150	03/29/18 10:21	

LABORATORY CONTROL SAMPLE & LCSD: 2873678 2873679

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	69.1	90.2	86	113	70-120	26	20	R1
n-Triacontane (S)	%.				82	75	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

QC Batch: 434844 Analysis Method: EPA 7196A
 QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 2008420 Matrix: Solid
 Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/03/18 11:09	

LABORATORY CONTROL SAMPLE: 2008421

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1090	929	85	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008432 2008433

Parameter	Units	50193104001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	2190	2230	ND	ND	0	0	75-125		20	2M, M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2008434 2008435

Parameter	Units	50193104001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	79.1	80.9	4.7J	6.3J	2	4	75-125		20	M3

SAMPLE DUPLICATE: 2008431

Parameter	Units	469837006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

QC Batch: 284583 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 1665486 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	03/29/18 12:56	

LABORATORY CONTROL SAMPLE: 1665487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665488 1665489

Parameter	Units	10424609003 Result	MS		MSD		% Rec	MSD	% Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Cyanide	mg/kg	ND	3.62	3.62	2.8	3.2	66	77	80-120	13	20	M0	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665490 1665491

Parameter	Units	10424937006 Result	MS		MSD		% Rec	MSD	% Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Cyanide	mg/kg	0.56	4.11	4.26	4.2	4.0	89	81	80-120	5	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

QC Batch: 139574 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

METHOD BLANK: 552775 Matrix: Solid
Associated Lab Samples: 10424609001, 10424609002, 10424609003, 10424609004, 10424609005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	03/30/18 17:59	

LABORATORY CONTROL SAMPLE: 552774

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	48.5	49.5	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 552776 552777

Parameter	Units	12106344002		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Fluoride	mg/kg	3.3	49	49.8	53.1	53.4	102	101	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 552778 552779

Parameter	Units	12106344011		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Fluoride	mg/kg	2.1	49.2	49.8	47.4	47.0	92	90	80-120	1	20	

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 529212

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.

2M Redox (25 mv) and pH (7.84) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.

3M Sample was black in color and needed to be centrifuged and decanted prior to analysis.

4M Sample was black in color and slightly viscous. Sample needed to be centrifuged and decanted prior to analysis.

5M Sample was dark brown in color.

6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

7M The sample was re-weighed into a new container because the original container had no tare weight.

C0 Result confirmed by second analysis.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D4	Sample was diluted due to the presence of high levels of target analytes.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
T6	High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids-Revised Report
Pace Project No.: 10424609

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424609001	FD-SB-A4 (26-32.5)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609004	FD-SB-D4-WM (5-20)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609005	FD-SB-E4-WM (3-21)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424609001	FD-SB-A4 (26-32.5)	EPA 3550	528957	EPA 8081B	530398
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3550	528957	EPA 8081B	530398
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3550	528957	EPA 8081B	530398
10424609004	FD-SB-D4-WM (5-20)	EPA 3550	528957	EPA 8081B	530398
10424609005	FD-SB-E4-WM (3-21)	EPA 3550	528957	EPA 8081B	530398
10424609001	FD-SB-A4 (26-32.5)	EPA 3550	528834	EPA 8082A	529071
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3550	528834	EPA 8082A	529071
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3550	528834	EPA 8082A	529071
10424609004	FD-SB-D4-WM (5-20)	EPA 3550	528834	EPA 8082A	529071
10424609005	FD-SB-E4-WM (3-21)	EPA 3550	528834	EPA 8082A	529071
10424609001	FD-SB-A4 (26-32.5)	WI MOD DRO	529461	WI MOD DRO	529593
10424609002	FD-SB-B4-WM (3-20 WM)	WI MOD DRO	529461	WI MOD DRO	529593
10424609003	FD-SB-C4-WM (5-20 WM)	WI MOD DRO	529461	WI MOD DRO	529593
10424609004	FD-SB-D4-WM (5-20)	WI MOD DRO	529461	WI MOD DRO	529593
10424609005	FD-SB-E4-WM (3-21)	WI MOD DRO	529084	WI MOD DRO	529165
10424609001	FD-SB-A4 (26-32.5)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609004	FD-SB-D4-WM (5-20)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609005	FD-SB-E4-WM (3-21)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424609001	FD-SB-A4 (26-32.5)	EPA 3050	528915	EPA 6010C	528992
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3050	528915	EPA 6010C	528992
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3050	528915	EPA 6010C	528992
10424609004	FD-SB-D4-WM (5-20)	EPA 3050	528915	EPA 6010C	528992
10424609005	FD-SB-E4-WM (3-21)	EPA 3050	528915	EPA 6010C	528992
10424609001	FD-SB-A4 (26-32.5)	EPA 3050B	434613	EPA 6020	434971
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3050B	434613	EPA 6020	434971
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3050B	434613	EPA 6020	434971
10424609004	FD-SB-D4-WM (5-20)	EPA 3050B	434613	EPA 6020	434971
10424609005	FD-SB-E4-WM (3-21)	EPA 3050B	434613	EPA 6020	434971
10424609001	FD-SB-A4 (26-32.5)	EPA 3050	528917	EPA 6020A	529111
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3050	528917	EPA 6020A	529111
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3050	528917	EPA 6020A	529111
10424609004	FD-SB-D4-WM (5-20)	EPA 3050	528917	EPA 6020A	529111
10424609005	FD-SB-E4-WM (3-21)	EPA 3050	528917	EPA 6020A	529111
10424609001	FD-SB-A4 (26-32.5)	EPA 7471	529743	EPA 7471	529845
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 7471	529743	EPA 7471	529845
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 7471	529743	EPA 7471	529845
10424609004	FD-SB-D4-WM (5-20)	EPA 7471	529743	EPA 7471	529845

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424609005	FD-SB-E4-WM (3-21)	EPA 7471	529743	EPA 7471	529845
10424609001	FD-SB-A4 (26-32.5)	ASTM D2974	528989		
10424609002	FD-SB-B4-WM (3-20 WM)	ASTM D2974	528989		
10424609003	FD-SB-C4-WM (5-20 WM)	ASTM D2974	528989		
10424609004	FD-SB-D4-WM (5-20)	ASTM D2974	528989		
10424609005	FD-SB-E4-WM (3-21)	ASTM D2974	528989		
10424609001	FD-SB-A4 (26-32.5)	EPA 3550	529268	EPA 8270D	529887
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3550	529268	EPA 8270D	529887
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3550	529268	EPA 8270D	529887
10424609004	FD-SB-D4-WM (5-20)	EPA 3550	529268	EPA 8270D	529887
10424609005	FD-SB-E4-WM (3-21)	EPA 3550	529268	EPA 8270D	529887
10424609001	FD-SB-A4 (26-32.5)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609004	FD-SB-D4-WM (5-20)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609005	FD-SB-E4-WM (3-21)	EPA 3550	528955	EPA 8270D by SIM	529226
10424609001	FD-SB-A4 (26-32.5)	EPA 3546	529569	EPA 8270D	530638
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3546	529569	EPA 8270D	530638
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3546	529569	EPA 8270D	530638
10424609004	FD-SB-D4-WM (5-20)	EPA 3546	529569	EPA 8270D	530638
10424609005	FD-SB-E4-WM (3-21)	EPA 3546	529569	EPA 8270D	530638
10424609001	FD-SB-A4 (26-32.5)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609004	FD-SB-D4-WM (5-20)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609005	FD-SB-E4-WM (3-21)	EPA 5035/5030B	528973	EPA 8260B	529212
10424609001	FD-SB-A4 (26-32.5)	EPA 3060A	434844	EPA 7196A	435162
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 3060A	434844	EPA 7196A	435162
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 3060A	434844	EPA 7196A	435162
10424609004	FD-SB-D4-WM (5-20)	EPA 3060A	434844	EPA 7196A	435162
10424609005	FD-SB-E4-WM (3-21)	EPA 3060A	434844	EPA 7196A	435162
10424609001	FD-SB-A4 (26-32.5)	Trivalent Chromium Calculation	435725		
10424609002	FD-SB-B4-WM (3-20 WM)	Trivalent Chromium Calculation	435725		
10424609003	FD-SB-C4-WM (5-20 WM)	Trivalent Chromium Calculation	435725		
10424609004	FD-SB-D4-WM (5-20)	Trivalent Chromium Calculation	435725		
10424609005	FD-SB-E4-WM (3-21)	Trivalent Chromium Calculation	435725		
10424609001	FD-SB-A4 (26-32.5)	EPA 9012A	284583	EPA 9012	284661
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 9012A	284583	EPA 9012	284661
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 9012A	284583	EPA 9012	284661
10424609004	FD-SB-D4-WM (5-20)	EPA 9012A	284583	EPA 9012	284661
10424609005	FD-SB-E4-WM (3-21)	EPA 9012A	284583	EPA 9012	284661

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids-Revised Report

Pace Project No.: 10424609

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424609001	FD-SB-A4 (26-32.5)	EPA 300.0	139574	EPA 9056A	139586
10424609002	FD-SB-B4-WM (3-20 WM)	EPA 300.0	139574	EPA 9056A	139586
10424609003	FD-SB-C4-WM (5-20 WM)	EPA 300.0	139574	EPA 9056A	139586
10424609004	FD-SB-D4-WM (5-20)	EPA 300.0	139574	EPA 9056A	139586
10424609005	FD-SB-E4-WM (3-21)	EPA 300.0	139574	EPA 9056A	139586

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

COC Type: 10424609

Turnaround Time:

COC ID:

PROJECT/CLIENT INFO

LABORATORY

ONLY

Facility Code: MPCA - Free Way LF Solids Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA - Free Way LF Solids Project Task Code:

Address: 18-00383

Project Manager:

EPIC Proj # 38716

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample-Routine Sample
 S-IVP-Integrated Vertical Profile Sample
 S-CWOP-Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wt-Ground=Groundwater
 Wt-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

PRESERV.

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	Lab Sample No.	#
FD-SB-A4 (26-32.5)	S	3/22/18	125	26"	32"	C	SD				13	X	X	001	1
FD-SB-B4-WM (3-20 W.M)	S	3/22/18	130	3'	20'	C	SD				13	X	X	002	2
FD-SB-C4-WM (5-20 W.M)	S	3/22/18	150	5'	20'	C	SD				13	X	X	003	3
FD-SB-D4-WM (5-20)	S	3/22/18	150	5'	20'	C	SD				13	X	X	004	4
FD-SB-E4-WM (3-21)	S	3/22/18	1630	3'	21'	C	SD				13	X	X	005	5
															6
															7
															8
															9
															10

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	3/22/18/1730	J. Grace	3-22-18 1740

T=4.9°C

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluorine, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt **Client Name:** Pace-Field **Project #:** **WO# : 10424609**

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

PM: BM2 **Due Date:** 04/06/18
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 4.9 **Cooler Temp Corrected (°C):** 4.9 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.8 **Date and Initials of Person Examining Contents:** 3/22/18 JD

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <u>3/22/18 JD</u>	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>No time on samples</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: BA JL **Date:** 3/23/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

40166401




Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424609 Workorder Name: MPCA - Freeway LF Solids Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis																	
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Cyanide by EPA 9012	LAB USE ONLY													
						Unpreserved																		
1	FD-SB-A4 (26-325) 001	PS	3/22/2018 11:25	10424609001	Solid	1					X													
2	FD-SB-B4-WM (3-20WM) 002	PS	3/22/2018 13:20	10424609002	Solid	1					X													
3	FD-SB-C4-WM (5-20WM) 003	PS	3/22/2018 15:00	10424609003	Solid	1					X													
4	FD-SB-D4-WM (5-20) 004	PS	3/22/2018 15:50	10424609004	Solid	1					X													
5	FD-SB-E4-WM (3-21) 005	PS	3/22/2018 16:30	10424609005	Solid	1					X													
Transfers												Comments												
Released By	Date/Time	Received By	Date/Time																					
<i>[Signature]</i> Pace	3/23/18 1730	<i>[Signature]</i>	3/24/18 0805																					
<i>[Signature]</i> Walter		<i>[Signature]</i> Pace																						
Cooler Temperature on Receipt 2 °C												Custody Seal <input checked="" type="checkbox"/> or N				Received on Ice <input checked="" type="checkbox"/> or N				Samples Intact Y or <input checked="" type="checkbox"/> N				


***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN Project #: _____
Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____
Tracking #: 1674108-1
Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used SR - 75 **Type of Ice:** Wet Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature Uncorr: 2 / Corr: 2

WO#: 40166401



40166401

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no
 Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Person examining contents:
 Date: 3/24/18
 Initials: SK

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>FRWO</u> <u>SK 3/24/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<u>SK 3/24/18</u>
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	10. <u>CO5 - lid cracked upon receipt - replaced by kb</u>
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. <u>SK 3/24/18</u>
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>No times on client labels</u>
-Includes date/time/ID/Analysis Matrix: <u>S</u>		<u>SK 3/24/18</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: CE Date: 3/26/18

Chain of Custody



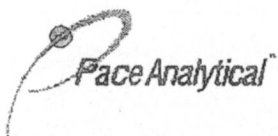
Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424609 Workorder Name: 18-00383 MPCA FreewayLF Solids Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis																												
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					Chromium III (calculation) Chromium VI Total Chromium by 6020															50193059 LAB USE ONLY													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers							Chromium III (calculation)	Chromium VI	Total Chromium by 6020	Requested Analysis												LAB USE ONLY							
						Unpreserved																													
1	FD-SB-A4 (26-32.5)	PS	3/22/2018 11:25	10424609001	Solid	1							X	X	X																				001
2	FD-SB-B4-WM (3-20 WM)	PS	3/22/2018 13:20	10424609002	Solid	1							X	X	X																				002
3	FD-SB-C4-WM (5-20 WM)	PS	3/22/2018 15:00	10424609003	Solid	1							X	X	X																				003
4	FD-SB-D4-WM (5-20)	PS	3/22/2018 15:50	10424609004	Solid	1							X	X	X																				004
5	FD-SB-E4-WM (3-21)	PS	3/22/2018 16:30	10424609005	Solid	1							X	X	X																				005
Transfers															Comments																				
Released By	Date/Time	Received By	Date/Time																																
1	Wing Kuo Pace	3/26/18 15:00	FED EX																																
2	FED EX		David [Signature]	3/27/18 09:55																															
3																																			
Cooler Temperature on Receipt		1.6 °C	Custody Seal		(Y) or N	Received on Ice		(Y) or N	Samples Intact								(Y) or N																		

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193059

Date/Time and Initials of person examining contents: 3/22/18 1950 JG

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7232

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 1.4/1.6 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)			All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:			Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:			Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)? Analysis:			Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			
Rush TAT Requested:			Headspace in VOA Vials (>6mm):			
Containers Intact?:			Trip Blank Present?:			
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:			

Comments:

Chain of Custody

WO#: 12106317

PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: M

Workorder: 10424609 Workorder Name: 18-00383 MPCA FreewayLF Solids Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis											
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380					Methyl Mercury by EPA 1630											
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved											Preserved Containers	
1	FD-SB-A4 (26-32.5)	PS	3/22/2018 11:25	10424609001	Solid	1												
2	FD-SB-B4-WM (3-20 WM)	PS	3/22/2018 13:20	10424609002	Solid	1												
3	FD-SB-C4-WM (5-20 WM)	PS	3/22/2018 15:00	10424609003	Solid	1												
4	FD-SB-D4-WM (5-20)	PS	3/22/2018 15:50	10424609004	Solid	1												
5	FD-SB-E4-WM (3-21)	PS	3/22/2018 16:30	10424609005	Solid	1												

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	3/26/18 10:35	<i>[Signature]</i>	3/27/18 10:20						

Cooler Temperature on Receipt 0.4 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace-Mpls Project #: _____

WO#: 12106317
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.4 Cooler Temp Corrected °C: 0.4 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: al 3/27/18

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N Heater JTD TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO#: 12106317



12106317

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

Workorder: 10424609 Workorder Name: 18-00383 MPCA FreewayLF Solids Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To			Subcontract To				Requested Analysis																						
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452			Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																										
							Preserved Containers							Fluoride by EPA 9056															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																						LAB USE ONLY	
1	FD-SB-A4 (26-32.5)	PS	3/22/2018 11:25	10424609001	Solid	1																							
2	FD-SB-B4-WM (3-20 WM)	PS	3/22/2018 13:20	10424609002	Solid	1																							
3	FD-SB-C4-WM (5-20 WM)	PS	3/22/2018 15:00	10424609003	Solid	1																							
4	FD-SB-D4-WM (5-20)	PS	3/22/2018 15:50	10424609004	Solid	1																							
5	FD-SB-E4-WM (3-21)	PS	3/22/2018 16:30	10424609005	Solid	1																							
																	Comments												
Transfers	Released By	Date/Time	Received By	Date/Time																									
1	<i>[Signature]</i>	3/26/18 1630	<i>[Signature]</i>	3/27/18 0925																									
2																													
3																													
Cooler Temperature on Receipt		1.3 °C	Custody Seal <u>Y</u> or N		Received on Ice <u>Y</u> or N		Samples Intact <u>Y</u> or N																						

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace Mpls

Project #:

WO# : 12106317
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: Bm 3/27/18

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

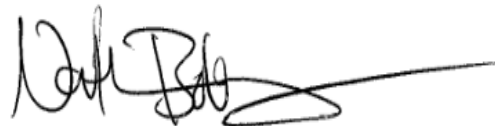
Pace Project #: 10424611
Sample Receipt Date: 03/22/2018
Client Project #: MPCA - Freeway LF Sol
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 04, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 4, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 61-73%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

Laboratory and matrix spike samples were also prepared with the sample batch using clean reference matrix or sample matrix that had been fortified with native standard materials. The results show that the spiked native TCDD was recovered at 94-102% with a relative percent difference of 0.1%. These results were within the target ranges for the method.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10424611



10424611



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: *MPCA-Free way LF solids* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA-Free way LF solids* Project Task Code:

Address:

Project Manager:

*18-00383
EPIC PDA/107 38716*

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wt-Ground=Groundwater
 Wt-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

PRESERV.

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
<i>FD-SB-A4 (26-32.5)</i>	<i>S</i>	<i>3/22/18</i>	<i>125</i>	<i>26"</i>	<i>32"</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>001</i>	<i>1</i>
<i>FD-SB-B4-WM (3-20 WM)</i>	<i>S</i>	<i>3/22/18</i>	<i>130</i>	<i>3"</i>	<i>20"</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>2</i>
<i>FD-SB-C4-WM (5-20 WM)</i>	<i>S</i>	<i>3/22/18</i>	<i>150</i>	<i>5'</i>	<i>20'</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>002</i>	<i>3</i>
<i>FD-SB-D4-WM (5-20)</i>	<i>S</i>	<i>3/22/18</i>	<i>150</i>	<i>5'</i>	<i>20'</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>4</i>
<i>FD-SB-E4-WM (3-21)</i>	<i>S</i>	<i>3/22/18</i>	<i>163</i>	<i>3'</i>	<i>21'</i>	<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>003</i>	<i>5</i>
														<i>6</i>
														<i>7</i>
														<i>8</i>
														<i>9</i>
														<i>10</i>

see attached sheet for 214/waste (-Dioxins)

+Dioxins

Sampled By: *David Anderson*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<i>David Anderson / Pace Analytical</i>	<i>3/22/18/1730</i>	<i>[Signature]</i>	<i>3-22-18 1740</i>

T=4.9°C

Sample Condition Upon Receipt Client Name: Pace Field Project #: **WO#: 10424611**
 Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): 4.9 Cooler Temp Corrected (°C): 4.9 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.5 Date and Initials of Person Examining Contents: 3/22/18 SD
 USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: <u>SD</u>	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>No time on samples</u>
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 03/23/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluorine, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA-8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A4 (26-325)		
Lab Sample ID	10424611001		
Filename	F180402B_16		
Injected By	SMT		
Total Amount Extracted	14.3 g	Matrix	Solid
% Moisture	67.7	Dilution	NA
Dry Weight Extracted	4.62 g	Collected	03/22/2018 11:25
ICAL ID	F180329	Received	03/22/2018 17:40
CCal Filename(s)	F180402B_04 & F180402B_21	Extracted	03/26/2018 15:05
Method Blank ID	BLANK-61315	Analyzed	04/03/2018 01:22

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	75

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-C4-WM (5-20 WM)		
Lab Sample ID	10424611002		
Filename	F180402B_17		
Injected By	SMT		
Total Amount Extracted	14.5 g	Matrix	Solid
% Moisture	19.9	Dilution	NA
Dry Weight Extracted	11.6 g	Collected	03/22/2018 15:00
ICAL ID	F180329	Received	03/22/2018 17:40
CCal Filename(s)	F180402B_04 & F180402B_21	Extracted	03/26/2018 15:05
Method Blank ID	BLANK-61315	Analyzed	04/03/2018 02:07

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	4.8	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	66

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-E4-WM (3-21)		
Lab Sample ID	10424611003		
Filename	F180402B_18		
Injected By	SMT		
Total Amount Extracted	14.4 g	Matrix	Solid
% Moisture	23.0	Dilution	NA
Dry Weight Extracted	11.1 g	Collected	03/22/2018 16:30
ICAL ID	F180329	Received	03/22/2018 17:40
CCal Filename(s)	F180402B_04 & F180402B_21	Extracted	03/26/2018 15:05
Method Blank ID	BLANK-61315	Analyzed	04/03/2018 02:52

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	66
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61315	Matrix	Solid
Filename	F180329A_17	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	03/26/2018 15:05
ICAL ID	F180329	Analyzed	03/29/2018 23:16
CCal Filename(s)	F180329A_12 & F180329A_26	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	57
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61316	Matrix	Solid
Filename	Y180329A_06	Dilution	NA
Total Amount Extracted	75.9 g	Extracted	03/26/2018 15:05
ICAL ID	Y180204	Analyzed	03/29/2018 17:06
CCal Filename(s)	Y180329A_01 & Y180329A_16	Injected By	SMT
Method Blank ID	BLANK-61315		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.19	94	2,3,7,8-TCDD-13C	2.0	50
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	49

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spiked Sample Report

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A4 (26-325)		
Lab Sample ID	10424611001-MS		
Filename	F180402B_19	Matrix	Solid
Total Amount Extracted	14.4 g	Dilution	NA
ICAL ID	F180329	Extracted	03/26/2018 15:05
CCal Filename(s)	F180402B_04 & F180402B_21	Analyzed	04/03/2018 03:37
Method Blank ID	BLANK-61315	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.20	102	2,3,7,8-TCDD-37Cl4	0.20	73
				2,3,7,8-TCDD-13C	2.00	71

Qs = Quantity Spiked

Qm = Quantity Measured

Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spiked Sample Report

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A4 (26-325)		
Lab Sample ID	10424611001-MSD		
Filename	F180403B_04	Matrix	Solid
Total Amount Extracted	14.3 g	Dilution	NA
ICAL ID	F180329	Extracted	03/26/2018 15:05
CCal Filename(s)	F180403B_01 & F180403B_18	Analyzed	04/03/2018 16:33
Method Blank ID	BLANK-61315	Injected By	SMT

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.20	102	2,3,7,8-TCDD-37Cl4	0.20	77
				2,3,7,8-TCDD-13C	2.00	76

Qs = Quantity Spiked

Qm = Quantity Measured

Rec. = Recovery (Expressed as Percent)

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Spike Sample Results

Client - PACE Minnesota Field

Client Sample ID	FD-SB-A4 (26-325)			<u>Dry Weights</u>	
Lab Sample ID	10424611001	Sample Filename	F180402B_16	Sample Amount	4.62 g
MS ID	10424611001-MS	MS Filename	F180402B_19	MS Amount	4.7 g
MSD ID	10424611001-MSD	MSD Filename	F180403B_04	MSD Amount	4.6 g

Analyte	Sample Conc. ng/Kg	MS/MSD Qs (ng)	MS Qm (ng)	MSD Qm (ng)	RPD	Background Subtracted		
						MS % Rec.	MSD % Rec.	RPD
2,3,7,8-TCDD	0.000	0.20	0.20	0.20	0.1	102	102	0.1

Definitions

MS = Matrix Spike	CDD = Chlorinated dibenzo-p-dioxin
MSD = Matrix Spike Duplicate	CDF = Chlorinated dibenzo-p-furan
Qm = Quantity Measured	T = Tetra
Qs = Quantity Spiked	Pe = Penta
% Rec. = Percent Recovery	Hx = Hexa
RPD = Relative Percent Difference	Hp = Hepta
NA = Not Applicable	O = Octa
NC = Not Calculated	

April 13, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 23, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424793001	FD-SB-A3-S (30-35)	Solid	03/23/18 12:30	03/23/18 16:00
10424793002	FD-SB-B3-WM (5-26)	Solid	03/23/18 13:30	03/23/18 16:00
10424793003	FD-SB-C3-WM (5-20)	Solid	03/23/18 14:30	03/23/18 16:00

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10424793001	FD-SB-A3-S (30-35)	EPA 1630 (1998)	CPK	1	PASI-M		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	LPM	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-M		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	PW1	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	JRH	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8270D	STB	12	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 9012	DAW	1	PASI-M		
		EPA 9056A	MCT	1	PASI-M		
		10424793002	FD-SB-B3-WM (5-26)	EPA 1630 (1998)	CPK	1	PASI-M
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	LPM			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-M		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	PW1			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	JLR, JRH			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8270D	STB			12	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 9012	DAW			1	PASI-M		
EPA 9056A	MCT			1	PASI-M		
10424793003	FD-SB-C3-WM (5-20)			EPA 1630 (1998)	CPK	1	PASI-M
				EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	LPM	2	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-M
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JRH	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-M
		Trivalent Chromium Calculation	SLB	1	PASI-M
		EPA 9012	DAW	1	PASI-M
		EPA 9056A	MCT	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-A3-S (30-35)** Lab ID: **10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	43.9	1	04/04/18 10:58	04/06/18 15:25		N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	309-00-2	
alpha-BHC	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	319-84-6	
beta-BHC	64.3	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	319-85-7	M1
delta-BHC	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	58-89-9	
Chlordane (Technical)	ND	ug/kg	166	2	03/28/18 12:51	04/05/18 18:51	57-74-9	
alpha-Chlordane	147	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	5103-71-9	M1
gamma-Chlordane	129	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	5103-74-2	M1
4,4'-DDD	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	72-54-8	
4,4'-DDE	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	72-55-9	
4,4'-DDT	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	50-29-3	
Dieldrin	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	60-57-1	
Endosulfan I	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	959-98-8	
Endosulfan II	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	33213-65-9	
Endosulfan sulfate	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	1031-07-8	
Endrin	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	72-20-8	
Endrin aldehyde	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	7421-93-4	
Endrin ketone	ND	ug/kg	33.1	2	03/28/18 12:51	04/05/18 18:51	53494-70-5	
Heptachlor	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	76-44-8	R1
Heptachlor epoxide	ND	ug/kg	16.6	2	03/28/18 12:51	04/05/18 18:51	1024-57-3	
Methoxychlor	ND	ug/kg	166	2	03/28/18 12:51	04/05/18 18:51	72-43-5	
Toxaphene	ND	ug/kg	497	2	03/28/18 12:51	04/05/18 18:51	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	37	%	30-150	2	03/28/18 12:51	04/05/18 18:51	877-09-8	4M, D4
Decachlorobiphenyl (S)	31	%	30-150	2	03/28/18 12:51	04/05/18 18:51	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	11100-14-4	
PCB, Total	ND	ug/kg	164	1	03/28/18 12:51	04/02/18 10:43	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%	48-125	1	03/28/18 12:51	04/02/18 10:43	877-09-8	
Decachlorobiphenyl (S)	87	%	30-134	1	03/28/18 12:51	04/02/18 10:43	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	67.6	1	03/27/18 16:31	03/30/18 14:50		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	72	%	50-150	1	03/27/18 16:31	03/30/18 14:50	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	92.6	1	03/30/18 14:11	03/31/18 01:45		
Surrogates								
a,a,a-Trifluorotoluene (S)	100	%	80-150	1	03/30/18 14:11	03/31/18 01:45	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	5600	mg/kg	48.7	1	03/28/18 04:51	04/02/18 12:27	7429-90-5	M1
Barium	252	mg/kg	2.4	1	03/28/18 04:51	04/02/18 12:27	7440-39-3	
Boron	524	mg/kg	36.6	1	03/28/18 04:51	04/02/18 12:27	7440-42-8	
Copper	24.2	mg/kg	2.4	1	03/28/18 04:51	04/02/18 12:27	7440-50-8	
Iron	15500	mg/kg	12.2	1	03/28/18 04:51	04/02/18 12:27	7439-89-6	M1, R1
Manganese	423	mg/kg	1.2	1	03/28/18 04:51	04/02/18 12:27	7439-96-5	
Nickel	11.3	mg/kg	4.9	1	03/28/18 04:51	04/02/18 12:27	7440-02-0	
Silver	ND	mg/kg	2.4	1	03/28/18 04:51	04/02/18 12:27	7440-22-4	
Tin	44.1	mg/kg	18.3	1	03/28/18 04:51	04/02/18 12:27	7440-31-5	
Titanium	158	mg/kg	6.1	1	03/28/18 04:51	04/02/18 12:27	7440-32-6	
Zinc	232	mg/kg	4.9	1	03/28/18 04:51	04/02/18 12:27	7440-66-6	M1
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	29.3	mg/kg	4.8	5	04/04/18 17:21	04/08/18 15:38	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	2.3	20	03/28/18 04:52	03/30/18 17:22	7440-36-0	
Arsenic	3.8	mg/kg	2.3	20	03/28/18 04:52	03/30/18 17:22	7440-38-2	
Beryllium	ND	mg/kg	0.94	20	03/28/18 04:52	03/30/18 17:22	7440-41-7	
Cadmium	0.72	mg/kg	0.38	20	03/28/18 04:52	03/30/18 17:22	7440-43-9	
Cobalt	3.4	mg/kg	2.3	20	03/28/18 04:52	03/30/18 17:22	7440-48-4	
Lead	308	mg/kg	0.47	20	03/28/18 04:52	03/30/18 17:22	7439-92-1	M6
Lithium	4.6	mg/kg	2.3	20	03/28/18 04:52	03/30/18 17:22	7439-93-2	
Selenium	ND	mg/kg	2.3	20	03/28/18 04:52	03/30/18 17:22	7782-49-2	
Strontium	47.6	mg/kg	2.3	20	03/28/18 04:52	03/30/18 17:22	7440-24-6	
Vanadium	15.0	mg/kg	4.7	20	03/28/18 04:52	03/30/18 17:22	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.12	mg/kg	0.090	1	03/28/18 04:53	03/30/18 12:41	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	79.9	%	0.10	1		03/28/18 12:44		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	83-32-9	
Acenaphthylene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	208-96-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	120-12-7	
Benzo(a)anthracene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	56-55-3	
Benzo(a)pyrene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	101-55-3	
Butylbenzylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	85-68-7	
Carbazole	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	59-50-7	
4-Chloroaniline	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	108-60-1	
2-Chloronaphthalene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	91-58-7	
2-Chlorophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	7005-72-3	
Chrysene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	53-70-3	
Dibenzofuran	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	120-83-2	
Diethylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	105-67-9	
Dimethylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	131-11-3	
Di-n-butylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	8430	1	03/27/18 12:47	03/30/18 14:19	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	606-20-2	
Di-n-octylphthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	117-81-7	
Fluoranthene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	206-44-0	
Fluorene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	87-68-3	
Hexachlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	118-74-1	
Hexachloroethane	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	193-39-5	
Isophorone	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	78-59-1	
1-Methylnaphthalene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	90-12-0	
2-Methylnaphthalene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	3270	1	03/27/18 12:47	03/30/18 14:19		
Naphthalene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	91-20-3	
2-Nitroaniline	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	88-74-4	
3-Nitroaniline	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	99-09-2	
4-Nitroaniline	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	100-01-6	
Nitrobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	98-95-3	
2-Nitrophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	88-75-5	
4-Nitrophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	86-30-6	
Pentachlorophenol	ND	ug/kg	3320	1	03/27/18 12:47	03/30/18 14:19	87-86-5	
Phenanthrene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	85-01-8	
Phenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	108-95-2	
Pyrene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	1640	1	03/27/18 12:47	03/30/18 14:19	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	62	%.	43-125	1	03/27/18 12:47	03/30/18 14:19	4165-60-0	
2-Fluorobiphenyl (S)	75	%.	30-132	1	03/27/18 12:47	03/30/18 14:19	321-60-8	
p-Terphenyl-d14 (S)	100	%.	62-125	1	03/27/18 12:47	03/30/18 14:19	1718-51-0	
Phenol-d6 (S)	69	%.	48-125	1	03/27/18 12:47	03/30/18 14:19	13127-88-3	
2-Fluorophenol (S)	61	%.	40-125	1	03/27/18 12:47	03/30/18 14:19	367-12-4	
2,4,6-Tribromophenol (S)	88	%.	60-125	1	03/27/18 12:47	03/30/18 14:19	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	83-32-9	
Acenaphthylene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	208-96-8	
Anthracene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	120-12-7	
Benzo(a)anthracene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	56-55-3	
Benzo(a)pyrene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	207-08-9	
Chrysene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	53-70-3	
Fluoranthene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	206-44-0	
Fluorene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	193-39-5	
Naphthalene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	91-20-3	
Phenanthrene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	85-01-8	
Pyrene	ND	ug/kg	49.7	1	03/27/18 15:20	04/02/18 22:27	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	68	%.	42-125	1	03/27/18 15:20	04/02/18 22:27	321-60-8	
p-Terphenyl-d14 (S)	88	%.	57-125	1	03/27/18 15:20	04/02/18 22:27	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	25057-89-0	
2,4-D	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	94-75-7	
2,4-DB	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	94-82-6	
Dicamba	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	1918-00-9	
Dinoseb	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	88-85-7	
MCPA	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	94-74-6	
Pentachlorophenol	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	87-86-5	
Picloram	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	1918-02-1	
2,4,5-T	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	93-72-1	
Triclopyr	ND	mg/kg	0.33	1	03/29/18 07:30	04/04/18 16:17	55335-06-3	
Surrogates								
2,4-DCAA (S)	71	%.	46-125	1	03/29/18 07:30	04/04/18 16:17	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	8250	1	03/27/18 14:03	03/27/18 16:51	67-64-1	
Allyl chloride	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	107-05-1	
Benzene	256	ug/kg	165	1	03/27/18 14:03	03/27/18 16:51	71-43-2	
Bromobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	108-86-1	
Bromochloromethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	74-97-5	
Bromodichloromethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	75-27-4	
Bromoform	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	75-25-2	
Bromomethane	ND	ug/kg	4120	1	03/27/18 14:03	03/27/18 16:51	74-83-9	
2-Butanone (MEK)	ND	ug/kg	2060	1	03/27/18 14:03	03/27/18 16:51	78-93-3	
n-Butylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	104-51-8	
sec-Butylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	135-98-8	
tert-Butylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	98-06-6	
Carbon tetrachloride	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	56-23-5	
Chlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	108-90-7	
Chloroethane	ND	ug/kg	4120	1	03/27/18 14:03	03/27/18 16:51	75-00-3	
Chloroform	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	67-66-3	
Chloromethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	74-87-3	
2-Chlorotoluene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	95-49-8	
4-Chlorotoluene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	4120	1	03/27/18 14:03	03/27/18 16:51	96-12-8	
Dibromochloromethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	106-93-4	
Dibromomethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	75-71-8	
1,1-Dichloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	75-34-3	
1,2-Dichloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	107-06-2	
1,1-Dichloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-A3-S (30-35) **Lab ID: 10424793001** Collected: 03/23/18 12:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	156-60-5	
Dichlorofluoromethane	ND	ug/kg	4120	1	03/27/18 14:03	03/27/18 16:51	75-43-4	
1,2-Dichloropropane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	78-87-5	
1,3-Dichloropropane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	142-28-9	
2,2-Dichloropropane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	594-20-7	
1,1-Dichloropropene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	60-29-7	
Ethylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	2060	1	03/27/18 14:03	03/27/18 16:51	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	98-82-8	
p-Isopropyltoluene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	99-87-6	
Methylene Chloride	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	2060	1	03/27/18 14:03	03/27/18 16:51	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	1634-04-4	
Naphthalene	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	91-20-3	
n-Propylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	103-65-1	
Styrene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	79-34-5	N2
Tetrachloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	127-18-4	
Tetrahydrofuran	ND	ug/kg	16500	1	03/27/18 14:03	03/27/18 16:51	109-99-9	
Toluene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	79-00-5	
Trichloroethene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 16:51	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	412	1	03/27/18 14:03	03/27/18 16:51	108-67-8	
Vinyl chloride	ND	ug/kg	165	1	03/27/18 14:03	03/27/18 16:51	75-01-4	
Xylene (Total)	ND	ug/kg	1240	1	03/27/18 14:03	03/27/18 16:51	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/27/18 14:03	03/27/18 16:51	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	03/27/18 14:03	03/27/18 16:51	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	03/27/18 14:03	03/27/18 16:51	460-00-4	

9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide	ND	mg/kg	1.7	1	04/05/18 10:35	04/05/18 14:44	57-12-5	
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9056 IC Anions

Analytical Method: EPA 9056A Preparation Method: EPA 300.0

Fluoride	ND	mg/kg	0.99	1	04/05/18 12:00	04/05/18 18:34	16984-48-8	
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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-B3-WM (5-26)** Lab ID: **10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.1	1	04/04/18 10:58	04/06/18 15:31		N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	309-00-2	
alpha-BHC	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	319-84-6	
beta-BHC	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	319-85-7	
delta-BHC	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	58-89-9	
Chlordane (Technical)	ND	ug/kg	117	5	03/28/18 12:51	04/10/18 14:33	57-74-9	
alpha-Chlordane	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	5103-71-9	
gamma-Chlordane	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	5103-74-2	
4,4'-DDD	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	72-54-8	
4,4'-DDE	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	72-55-9	
4,4'-DDT	24.5	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	50-29-3	
Dieldrin	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	60-57-1	
Endosulfan I	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	959-98-8	
Endosulfan II	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	33213-65-9	
Endosulfan sulfate	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	1031-07-8	
Endrin	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	72-20-8	
Endrin aldehyde	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	7421-93-4	
Endrin ketone	ND	ug/kg	23.3	5	03/28/18 12:51	04/10/18 14:33	53494-70-5	
Heptachlor	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.7	5	03/28/18 12:51	04/10/18 14:33	1024-57-3	
Methoxychlor	ND	ug/kg	117	5	03/28/18 12:51	04/10/18 14:33	72-43-5	
Toxaphene	ND	ug/kg	349	5	03/28/18 12:51	04/10/18 14:33	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	30-150	5	03/28/18 12:51	04/10/18 14:33	877-09-8	3M,D4
Decachlorobiphenyl (S)	99	%	30-150	5	03/28/18 12:51	04/10/18 14:33	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	12672-29-6	
PCB-1254 (Aroclor 1254)	551	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	11100-14-4	
PCB, Total	551	ug/kg	45.8	1	03/28/18 12:51	04/02/18 12:49	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	72	%	48-125	1	03/28/18 12:51	04/02/18 12:49	877-09-8	
Decachlorobiphenyl (S)	73	%	30-134	1	03/28/18 12:51	04/02/18 12:49	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	23.3	mg/kg	22.2	1	03/27/18 16:31	03/30/18 14:22		T6,T7

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-B3-WM (5-26) **Lab ID: 10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	59	%	50-150	1	03/27/18 16:31	03/30/18 14:22	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	35.5	1	03/30/18 14:11	03/31/18 02:09		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	03/30/18 14:11	03/31/18 02:09	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9250	mg/kg	13.7	1	03/28/18 04:51	04/02/18 12:46	7429-90-5	
Barium	84.4	mg/kg	0.68	1	03/28/18 04:51	04/02/18 12:46	7440-39-3	
Boron	216	mg/kg	10.3	1	03/28/18 04:51	04/02/18 12:46	7440-42-8	
Copper	24.7	mg/kg	0.68	1	03/28/18 04:51	04/02/18 12:46	7440-50-8	
Iron	40200	mg/kg	34.2	10	03/28/18 04:51	04/02/18 13:32	7439-89-6	
Manganese	141	mg/kg	0.34	1	03/28/18 04:51	04/02/18 12:46	7439-96-5	
Nickel	58.3	mg/kg	1.4	1	03/28/18 04:51	04/02/18 12:46	7440-02-0	
Silver	5.5	mg/kg	0.68	1	03/28/18 04:51	04/02/18 12:46	7440-22-4	
Tin	7.4	mg/kg	5.1	1	03/28/18 04:51	04/02/18 12:46	7440-31-5	
Titanium	416	mg/kg	1.7	1	03/28/18 04:51	04/02/18 12:46	7440-32-6	
Zinc	215	mg/kg	1.4	1	03/28/18 04:51	04/02/18 12:46	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	3.6	mg/kg	1.3	5	04/04/18 17:21	04/08/18 15:42	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7440-36-0	
Arsenic	16.1	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7440-38-2	
Beryllium	2.2	mg/kg	0.27	20	03/28/18 04:52	03/30/18 17:07	7440-41-7	
Cadmium	1.1	mg/kg	0.11	20	03/28/18 04:52	03/30/18 17:07	7440-43-9	
Cobalt	9.0	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7440-48-4	
Lead	67.9	mg/kg	0.13	20	03/28/18 04:52	03/30/18 17:07	7439-92-1	
Lithium	8.5	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7439-93-2	
Selenium	5.3	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7782-49-2	
Strontium	49.6	mg/kg	0.66	20	03/28/18 04:52	03/30/18 17:07	7440-24-6	
Vanadium	239	mg/kg	1.3	20	03/28/18 04:52	03/30/18 17:07	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.072	mg/kg	0.025	1	03/28/18 04:53	03/30/18 12:47	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	28.4	%	0.10	1		03/28/18 12:44		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	461	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	83-32-9	
Acenaphthylene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-B3-WM (5-26) **Lab ID: 10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	885	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	120-12-7	
Benzo(a)anthracene	1780	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	56-55-3	
Benzo(a)pyrene	1190	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	50-32-8	
Benzo(b)fluoranthene	2010	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	205-99-2	
Benzo(g,h,i)perylene	782	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	191-24-2	
Benzo(k)fluoranthene	689	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	101-55-3	
Butylbenzylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	85-68-7	
Carbazole	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	59-50-7	
4-Chloroaniline	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	108-60-1	
2-Chloronaphthalene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	91-58-7	
2-Chlorophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	7005-72-3	
Chrysene	2180	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	53-70-3	
Dibenzofuran	515	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	120-83-2	
Diethylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	105-67-9	
Dimethylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	131-11-3	
Di-n-butylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2370	1	03/27/18 12:47	03/30/18 15:50	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	606-20-2	
Di-n-octylphthalate	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	122-66-7	
bis(2-Ethylhexyl)phthalate	1660	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	117-81-7	
Fluoranthene	6860	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	206-44-0	
Fluorene	933	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	87-68-3	
Hexachlorobenzene	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	118-74-1	
Hexachloroethane	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	67-72-1	
Indeno(1,2,3-cd)pyrene	676	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	193-39-5	
Isophorone	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-B3-WM (5-26) **Lab ID: 10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	1120	ug/kg	921	1	03/27/18 12:47	03/30/18 15:50		
Naphthalene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	91-20-3	
2-Nitroaniline	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	88-74-4	
3-Nitroaniline	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	99-09-2	
4-Nitroaniline	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	100-01-6	
Nitrobenzene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	98-95-3	
2-Nitrophenol	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	88-75-5	
4-Nitrophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	86-30-6	
Pentachlorophenol	ND	ug/kg	935	1	03/27/18 12:47	03/30/18 15:50	87-86-5	
Phenanthrene	7060	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	85-01-8	
Phenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	108-95-2	
Pyrene	3740	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2300	5	03/27/18 12:47	03/30/18 20:23	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	460	1	03/27/18 12:47	03/30/18 15:50	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	64	%.	43-125	5	03/27/18 12:47	03/30/18 20:23	4165-60-0	D3
2-Fluorobiphenyl (S)	76	%.	30-132	1	03/27/18 12:47	03/30/18 15:50	321-60-8	
p-Terphenyl-d14 (S)	59	%.	62-125	1	03/27/18 12:47	03/30/18 15:50	1718-51-0	S5
Phenol-d6 (S)	66	%.	48-125	1	03/27/18 12:47	03/30/18 15:50	13127-88-3	
2-Fluorophenol (S)	66	%.	40-125	1	03/27/18 12:47	03/30/18 15:50	367-12-4	
2,4,6-Tribromophenol (S)	67	%.	60-125	1	03/27/18 12:47	03/30/18 15:50	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	83-32-9	
Acenaphthylene	ND	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	208-96-8	
Anthracene	1510	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	120-12-7	
Benzo(a)anthracene	4020	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	56-55-3	
Benzo(a)pyrene	2730	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	50-32-8	
Benzo(b)fluoranthene	4020	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	205-99-2	
Benzo(g,h,i)perylene	1670	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	191-24-2	
Benzo(k)fluoranthene	1260	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	207-08-9	
Chrysene	3660	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	53-70-3	
Fluoranthene	10600	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	206-44-0	
Fluorene	861	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	86-73-7	
Indeno(1,2,3-cd)pyrene	1590	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	193-39-5	
Naphthalene	ND	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	91-20-3	
Phenanthrene	7760	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	85-01-8	
Pyrene	8170	ug/kg	698	50	03/27/18 15:20	04/04/18 12:25	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	50	03/27/18 15:20	04/04/18 12:25	321-60-8	D4,S4
p-Terphenyl-d14 (S)	0	%.	57-125	50	03/27/18 15:20	04/04/18 12:25	1718-51-0	S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-B3-WM (5-26) **Lab ID: 10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	25057-89-0	
2,4-D	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	94-75-7	
2,4-DB	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	94-82-6	
Dicamba	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	1918-00-9	
Dinoseb	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	88-85-7	
MCPA	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	94-74-6	
Pentachlorophenol	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	87-86-5	
Picloram	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	1918-02-1	
2,4,5-T	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	93-72-1	
Triclopyr	ND	mg/kg	0.091	1	03/29/18 07:30	04/04/18 16:32	55335-06-3	
Surrogates								
2,4-DCAA (S)	71	%.	46-125	1	03/29/18 07:30	04/04/18 16:32	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	3470	1	03/27/18 14:03	03/27/18 17:08	67-64-1	
Allyl chloride	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	107-05-1	
Benzene	ND	ug/kg	69.3	1	03/27/18 14:03	03/27/18 17:08	71-43-2	
Bromobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	108-86-1	
Bromochloromethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	74-97-5	
Bromodichloromethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	75-27-4	
Bromoform	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	75-25-2	
Bromomethane	ND	ug/kg	1730	1	03/27/18 14:03	03/27/18 17:08	74-83-9	
2-Butanone (MEK)	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 17:08	78-93-3	
n-Butylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	104-51-8	
sec-Butylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	135-98-8	
tert-Butylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	98-06-6	
Carbon tetrachloride	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	56-23-5	
Chlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	108-90-7	
Chloroethane	ND	ug/kg	1730	1	03/27/18 14:03	03/27/18 17:08	75-00-3	
Chloroform	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	67-66-3	
Chloromethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	74-87-3	
2-Chlorotoluene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	95-49-8	
4-Chlorotoluene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1730	1	03/27/18 14:03	03/27/18 17:08	96-12-8	
Dibromochloromethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	106-93-4	
Dibromomethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	75-71-8	
1,1-Dichloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	75-34-3	
1,2-Dichloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	107-06-2	
1,1-Dichloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	156-59-2	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-B3-WM (5-26)** Lab ID: **10424793002** Collected: 03/23/18 13:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1730	1	03/27/18 14:03	03/27/18 17:08	75-43-4	
1,2-Dichloropropane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	78-87-5	
1,3-Dichloropropane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	142-28-9	
2,2-Dichloropropane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	594-20-7	
1,1-Dichloropropene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	60-29-7	
Ethylbenzene	535	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 17:08	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	98-82-8	
p-Isopropyltoluene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	99-87-6	
Methylene Chloride	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 17:08	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	1634-04-4	
Naphthalene	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	91-20-3	
n-Propylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	103-65-1	
Styrene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	79-34-5	N2
Tetrachloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	127-18-4	
Tetrahydrofuran	ND	ug/kg	6930	1	03/27/18 14:03	03/27/18 17:08	109-99-9	
Toluene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	79-00-5	
Trichloroethene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	693	1	03/27/18 14:03	03/27/18 17:08	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	173	1	03/27/18 14:03	03/27/18 17:08	108-67-8	
Vinyl chloride	ND	ug/kg	69.3	1	03/27/18 14:03	03/27/18 17:08	75-01-4	
Xylene (Total)	1440	ug/kg	520	1	03/27/18 14:03	03/27/18 17:08	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/27/18 14:03	03/27/18 17:08	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	03/27/18 14:03	03/27/18 17:08	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	03/27/18 14:03	03/27/18 17:08	460-00-4	

9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide	ND	mg/kg	0.39	1	04/05/18 10:35	04/05/18 14:47	57-12-5	
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9056 IC Anions

Analytical Method: EPA 9056A Preparation Method: EPA 300.0

Fluoride	1.7	mg/kg	0.99	1	04/05/18 12:00	04/05/18 17:36	16984-48-8	M1
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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-C3-WM (5-20)** Lab ID: **10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.57	1	04/04/18 10:58	04/06/18 15:38		N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	309-00-2	
alpha-BHC	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	319-84-6	
beta-BHC	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	319-85-7	
delta-BHC	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	58-89-9	
Chlordane (Technical)	ND	ug/kg	434	20	03/28/18 12:51	04/06/18 00:20	57-74-9	
alpha-Chlordane	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	5103-71-9	
gamma-Chlordane	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	5103-74-2	
4,4'-DDD	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	72-54-8	
4,4'-DDE	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	72-55-9	
4,4'-DDT	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	50-29-3	
Dieldrin	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	60-57-1	
Endosulfan I	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	959-98-8	
Endosulfan II	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	33213-65-9	
Endosulfan sulfate	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	1031-07-8	
Endrin	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	72-20-8	
Endrin aldehyde	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	7421-93-4	
Endrin ketone	ND	ug/kg	86.6	20	03/28/18 12:51	04/06/18 00:20	53494-70-5	
Heptachlor	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	76-44-8	
Heptachlor epoxide	ND	ug/kg	43.4	20	03/28/18 12:51	04/06/18 00:20	1024-57-3	
Methoxychlor	ND	ug/kg	434	20	03/28/18 12:51	04/06/18 00:20	72-43-5	
Toxaphene	ND	ug/kg	1300	20	03/28/18 12:51	04/06/18 00:20	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	20	03/28/18 12:51	04/06/18 00:20	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	20	03/28/18 12:51	04/06/18 00:20	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	12672-29-6	
PCB-1254 (Aroclor 1254)	144	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	11100-14-4	
PCB, Total	144	ug/kg	42.5	1	03/28/18 12:51	04/02/18 10:59	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%.	48-125	1	03/28/18 12:51	04/02/18 10:59	877-09-8	
Decachlorobiphenyl (S)	84	%.	30-134	1	03/28/18 12:51	04/02/18 10:59	2051-24-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	222	mg/kg	126	1	03/27/18 16:31	03/30/18 14:14		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	1	03/27/18 16:31	03/30/18 14:14	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.5	1	03/30/18 14:11	03/31/18 02:33		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	03/30/18 14:11	03/31/18 02:33	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8090	mg/kg	12.6	1	03/28/18 04:51	04/02/18 12:48	7429-90-5	
Barium	235	mg/kg	0.63	1	03/28/18 04:51	04/02/18 12:48	7440-39-3	
Boron	75.4	mg/kg	9.5	1	03/28/18 04:51	04/02/18 12:48	7440-42-8	
Copper	119	mg/kg	0.63	1	03/28/18 04:51	04/02/18 12:48	7440-50-8	
Iron	47000	mg/kg	31.6	10	03/28/18 04:51	04/02/18 13:34	7439-89-6	
Manganese	951	mg/kg	3.2	10	03/28/18 04:51	04/02/18 13:34	7439-96-5	
Nickel	29.5	mg/kg	1.3	1	03/28/18 04:51	04/02/18 12:48	7440-02-0	
Silver	1.0	mg/kg	0.63	1	03/28/18 04:51	04/02/18 12:48	7440-22-4	
Tin	114	mg/kg	4.7	1	03/28/18 04:51	04/02/18 12:48	7440-31-5	
Titanium	238	mg/kg	1.6	1	03/28/18 04:51	04/02/18 12:48	7440-32-6	
Zinc	799	mg/kg	1.3	1	03/28/18 04:51	04/02/18 12:48	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	118	mg/kg	1.2	5	04/04/18 17:21	04/08/18 15:47	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	0.96	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7440-36-0	
Arsenic	7.9	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7440-38-2	
Beryllium	0.43	mg/kg	0.26	20	03/28/18 04:52	03/30/18 17:12	7440-41-7	
Cadmium	2.0	mg/kg	0.10	20	03/28/18 04:52	03/30/18 17:12	7440-43-9	
Cobalt	4.8	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7440-48-4	
Lead	151	mg/kg	0.13	20	03/28/18 04:52	03/30/18 17:12	7439-92-1	
Lithium	4.2	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7439-93-2	
Selenium	1.2	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7782-49-2	
Strontium	31.8	mg/kg	0.64	20	03/28/18 04:52	03/30/18 17:12	7440-24-6	
Vanadium	30.5	mg/kg	1.3	20	03/28/18 04:52	03/30/18 17:12	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.44	mg/kg	0.024	1	03/28/18 04:53	03/30/18 12:53	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	23.1	%	0.10	1		03/28/18 12:44		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	208-96-8	
Anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	120-12-7	
Benzo(a)anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	56-55-3	
Benzo(a)pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	50-32-8	
Benzo(b)fluoranthene	475	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	101-55-3	
Butylbenzylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	85-68-7	
Carbazole	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	59-50-7	
4-Chloroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	108-60-1	
2-Chloronaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	91-58-7	
2-Chlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	7005-72-3	
Chrysene	449	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	53-70-3	
Dibenzofuran	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	120-83-2	
Diethylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	105-67-9	
Dimethylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	131-11-3	
Di-n-butylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2200	1	03/27/18 12:47	03/30/18 16:21	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	606-20-2	
Di-n-octylphthalate	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	122-66-7	
bis(2-Ethylhexyl)phthalate	1490	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	117-81-7	
Fluoranthene	747	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	206-44-0	
Fluorene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	87-68-3	
Hexachlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	118-74-1	
Hexachloroethane	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	193-39-5	
Isophorone	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	78-59-1	
1-Methylnaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	90-12-0	
2-Methylnaphthalene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: **FD-SB-C3-WM (5-20)** Lab ID: **10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	855	1	03/27/18 12:47	03/30/18 16:21		
Naphthalene	1710	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	91-20-3	
2-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	88-74-4	
3-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	99-09-2	
4-Nitroaniline	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	100-01-6	
Nitrobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	98-95-3	
2-Nitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	88-75-5	
4-Nitrophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	86-30-6	
Pentachlorophenol	ND	ug/kg	868	1	03/27/18 12:47	03/30/18 16:21	87-86-5	
Phenanthrene	822	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	85-01-8	
Phenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	108-95-2	
Pyrene	724	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	428	1	03/27/18 12:47	03/30/18 16:21	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	57	%	43-125	1	03/27/18 12:47	03/30/18 16:21	4165-60-0	
2-Fluorobiphenyl (S)	73	%	30-132	1	03/27/18 12:47	03/30/18 16:21	321-60-8	
p-Terphenyl-d14 (S)	70	%	62-125	1	03/27/18 12:47	03/30/18 16:21	1718-51-0	
Phenol-d6 (S)	59	%	48-125	1	03/27/18 12:47	03/30/18 16:21	13127-88-3	
2-Fluorophenol (S)	59	%	40-125	1	03/27/18 12:47	03/30/18 16:21	367-12-4	
2,4,6-Tribromophenol (S)	63	%	60-125	1	03/27/18 12:47	03/30/18 16:21	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	1090	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	83-32-9	
Acenaphthylene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	208-96-8	
Anthracene	831	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	120-12-7	
Benzo(a)anthracene	351	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	56-55-3	
Benzo(a)pyrene	378	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	50-32-8	
Benzo(b)fluoranthene	483	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	207-08-9	
Chrysene	439	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	53-70-3	
Fluoranthene	1640	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	206-44-0	
Fluorene	1020	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	193-39-5	
Naphthalene	3510	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	91-20-3	
Phenanthrene	3430	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	85-01-8	
Pyrene	1120	ug/kg	324	5	03/27/18 15:20	04/03/18 23:44	129-00-0	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	5	03/27/18 15:20	04/03/18 23:44	321-60-8	D3,P3, S4
p-Terphenyl-d14 (S)	0	%	57-125	5	03/27/18 15:20	04/03/18 23:44	1718-51-0	S4
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	25057-89-0	
2,4-D	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	94-75-7	
2,4-DB	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	94-82-6	
Dicamba	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	1918-00-9	
Dinoseb	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	88-85-7	
MCPA	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	94-74-6	
Pentachlorophenol	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	87-86-5	
Picloram	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	1918-02-1	
2,4,5-T	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	93-72-1	
Triclopyr	ND	mg/kg	0.21	5	03/29/18 07:30	04/04/18 19:13	55335-06-3	
Surrogates								
2,4-DCAA (S)	61	%	46-125	5	03/29/18 07:30	04/04/18 19:13	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1370	1	03/27/18 14:03	03/27/18 17:25	67-64-1	
Allyl chloride	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	107-05-1	
Benzene	ND	ug/kg	27.4	1	03/27/18 14:03	03/27/18 17:25	71-43-2	
Bromobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	108-86-1	
Bromochloromethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	74-97-5	
Bromodichloromethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	75-27-4	
Bromoform	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	75-25-2	
Bromomethane	ND	ug/kg	684	1	03/27/18 14:03	03/27/18 17:25	74-83-9	
2-Butanone (MEK)	ND	ug/kg	342	1	03/27/18 14:03	03/27/18 17:25	78-93-3	
n-Butylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	104-51-8	
sec-Butylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	135-98-8	
tert-Butylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	98-06-6	
Carbon tetrachloride	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	56-23-5	
Chlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	108-90-7	
Chloroethane	ND	ug/kg	684	1	03/27/18 14:03	03/27/18 17:25	75-00-3	
Chloroform	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	67-66-3	
Chloromethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	74-87-3	
2-Chlorotoluene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	95-49-8	
4-Chlorotoluene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	684	1	03/27/18 14:03	03/27/18 17:25	96-12-8	
Dibromochloromethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	106-93-4	
Dibromomethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	541-73-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,4-Dichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	75-71-8	
1,1-Dichloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	75-34-3	
1,2-Dichloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	107-06-2	
1,1-Dichloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	156-60-5	
Dichlorofluoromethane	ND	ug/kg	684	1	03/27/18 14:03	03/27/18 17:25	75-43-4	
1,2-Dichloropropane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	78-87-5	
1,3-Dichloropropane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	142-28-9	
2,2-Dichloropropane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	594-20-7	
1,1-Dichloropropene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	60-29-7	
Ethylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	342	1	03/27/18 14:03	03/27/18 17:25	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	98-82-8	
p-Isopropyltoluene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	99-87-6	
Methylene Chloride	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	342	1	03/27/18 14:03	03/27/18 17:25	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	1634-04-4	
Naphthalene	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	91-20-3	
n-Propylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	103-65-1	
Styrene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	79-34-5	N2
Tetrachloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	127-18-4	
Tetrahydrofuran	ND	ug/kg	2740	1	03/27/18 14:03	03/27/18 17:25	109-99-9	
Toluene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	79-00-5	
Trichloroethene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	274	1	03/27/18 14:03	03/27/18 17:25	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	68.4	1	03/27/18 14:03	03/27/18 17:25	108-67-8	
Vinyl chloride	ND	ug/kg	27.4	1	03/27/18 14:03	03/27/18 17:25	75-01-4	
Xylene (Total)	ND	ug/kg	205	1	03/27/18 14:03	03/27/18 17:25	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/27/18 14:03	03/27/18 17:25	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	03/27/18 14:03	03/27/18 17:25	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125	1	03/27/18 14:03	03/27/18 17:25	460-00-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Sample: FD-SB-C3-WM (5-20) **Lab ID: 10424793003** Collected: 03/23/18 14:30 Received: 03/23/18 16:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent								
Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	12.8	5	04/05/18 08:00	04/06/18 13:32		D3
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	118	mg/kg	1.0	1		04/09/18 12:27		
9012 Cyanide, Total								
Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	0.41	1	04/05/18 10:35	04/05/18 14:47	57-12-5	
9056 IC Anions								
Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	3.9	mg/kg	0.99	1	04/05/18 12:00	04/05/18 18:54	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids
Pace Project No.: 10424793

QC Batch: 140178 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 555070 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.18	04/06/18 13:51	N3

METHOD BLANK: 555071 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.20	04/06/18 13:58	N3

METHOD BLANK: 555072 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.03	04/06/18 14:05	N3

LABORATORY CONTROL SAMPLE: 555073

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	105	90.2	86	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 555074 555075

Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	446	407	290	293	65	72	65-135	1	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529815 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2875655 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	03/30/18 17:39	
a,a,a-Trifluorotoluene (S)	%.	100	80-150	03/30/18 17:39	

LABORATORY CONTROL SAMPLE & LCSD: 2875656 2875657

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	46.3	44.7	93	89	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%.				99	99	80-150			

MATRIX SPIKE SAMPLE: 2876408

Parameter	Units	10424443005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	60.8	115	187	80-120	C0,M1
a,a,a-Trifluorotoluene (S)	%.				98	80-150	

SAMPLE DUPLICATE: 2876409

Parameter	Units	10424609003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	104	107	3	20	
a,a,a-Trifluorotoluene (S)	%.	99	99	0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529342

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873298

Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	03/30/18 12:37	

LABORATORY CONTROL SAMPLE: 2873299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.51	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873300 2873301

Parameter	Units	2873300		2873301		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424793001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury	mg/kg	0.12	2.2	2.4	2.6	109	105	80-120	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529339 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873286 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	10.0	04/02/18 12:22	
Barium	mg/kg	ND	0.50	04/02/18 12:22	
Boron	mg/kg	ND	7.5	04/02/18 12:22	
Copper	mg/kg	ND	0.50	04/02/18 12:22	
Iron	mg/kg	24.4	2.5	04/02/18 12:22	
Manganese	mg/kg	ND	0.25	04/02/18 12:22	
Nickel	mg/kg	ND	1.0	04/02/18 12:22	
Silver	mg/kg	ND	0.50	04/02/18 12:22	
Tin	mg/kg	ND	3.8	04/02/18 12:22	
Titanium	mg/kg	ND	1.2	04/02/18 12:22	
Zinc	mg/kg	ND	1.0	04/02/18 12:22	

LABORATORY CONTROL SAMPLE: 2873287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	962	978	102	80-120	
Barium	mg/kg	48.1	50.1	104	80-120	
Boron	mg/kg	48.1	45.5	95	80-120	
Copper	mg/kg	48.1	47.2	98	80-120	
Iron	mg/kg	962	1000	104	80-120	
Manganese	mg/kg	48.1	50.6	105	80-120	
Nickel	mg/kg	48.1	49.2	102	80-120	
Silver	mg/kg	24	22.4	93	80-120	
Tin	mg/kg	48.1	49.1	102	80-120	
Titanium	mg/kg	48.1	48.7	101	80-120	
Zinc	mg/kg	48.1	48.2	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873288 2873289

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	Result							Result
Aluminum	mg/kg	5600	4830	4830	12100	12700	134	147	75-125	5	20	M1
Barium	mg/kg	252	241	241	474	480	92	95	75-125	1	20	
Boron	mg/kg	524	241	241	778	802	105	115	75-125	3	20	
Copper	mg/kg	24.2	241	241	275	298	104	113	75-125	8	20	
Iron	mg/kg	15500	4830	4830	18100	23200	55	161	75-125	25	20	M1,R1
Manganese	mg/kg	423	241	241	614	675	79	104	75-125	9	20	
Nickel	mg/kg	11.3	241	241	256	262	101	104	75-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2873288		2873289		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
		10424793001 Result	MS Spike Conc.	MSD Spike Conc.	RPD						RPD		
Silver	mg/kg	ND	121	121	113	110	93	91	75-125	2	20		
Tin	mg/kg	44.1	241	241	272	273	95	95	75-125	0	20		
Titanium	mg/kg	158	241	241	391	406	96	103	75-125	4	20		
Zinc	mg/kg	232	241	241	411	487	74	106	75-125	17	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 435596 Analysis Method: EPA 6020
QC Batch Method: EPA 3050B Analysis Description: 6020 MET
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2011670 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	04/08/18 14:34	N2

LABORATORY CONTROL SAMPLE: 2011671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.8	102	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011672 2011673

Parameter	Units	2011672		2011673		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium	mg/kg	51.1	4.81	4.81	48.6	136	-52	1770	75-125	95	20	1M, E, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529341 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873294 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	03/30/18 17:03	
Arsenic	mg/kg	ND	0.50	03/30/18 17:03	
Beryllium	mg/kg	ND	0.20	03/30/18 17:03	
Cadmium	mg/kg	ND	0.080	03/30/18 17:03	
Cobalt	mg/kg	ND	0.50	03/30/18 17:03	
Lead	mg/kg	ND	0.10	03/30/18 17:03	
Lithium	mg/kg	ND	0.50	03/30/18 17:03	
Selenium	mg/kg	ND	0.50	03/30/18 17:03	
Strontium	mg/kg	ND	0.50	03/30/18 17:03	
Vanadium	mg/kg	ND	1.0	03/30/18 17:03	

LABORATORY CONTROL SAMPLE: 2873295

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49.5	49.3	100	80-120	
Arsenic	mg/kg	49.5	49.1	99	80-120	
Beryllium	mg/kg	49.5	46.9	95	80-120	
Cadmium	mg/kg	49.5	48.8	99	80-120	
Cobalt	mg/kg	49.5	49.6	100	80-120	
Lead	mg/kg	49.5	50.3	102	80-120	
Lithium	mg/kg	49.5	45.7	92	80-120	
Selenium	mg/kg	49.5	48.0	97	80-120	
Strontium	mg/kg	49.5	48.3	98	80-120	
Vanadium	mg/kg	49.5	51.0	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873296 2873297

Parameter	Units	10424793001		2873296		2873297		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Antimony	mg/kg	ND	239	239	239	192	203	80	85	75-125	5	20	
Arsenic	mg/kg	3.8	239	239	239	223	236	92	97	75-125	5	20	
Beryllium	mg/kg	ND	239	239	239	219	234	91	98	75-125	7	20	
Cadmium	mg/kg	0.72	239	239	239	221	234	92	98	75-125	6	20	
Cobalt	mg/kg	3.4	239	239	239	228	242	94	100	75-125	6	20	
Lead	mg/kg	308	239	239	239	641	734	139	178	75-125	14	20 M6	
Lithium	mg/kg	4.6	239	239	239	216	232	88	95	75-125	7	20	
Selenium	mg/kg	ND	239	239	239	215	223	90	93	75-125	4	20	
Strontium	mg/kg	47.6	239	239	239	265	304	91	107	75-125	14	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2873296		2873297									
Parameter	Units	10424793001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Vanadium	mg/kg	15.0	239	239	247	275	97	109	75-125	11	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch:	529398	Analysis Method:	ASTM D2974
QC Batch Method:	ASTM D2974	Analysis Description:	Dry Weight / %M by ASTM D2974
Associated Lab Samples:	10424793001, 10424793002, 10424793003		

SAMPLE DUPLICATE: 2873484

Parameter	Units	10424937006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	31.8	32.4	2	30	

SAMPLE DUPLICATE: 2873740

Parameter	Units	10424803007 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.4	4.9	10	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529276 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2872633 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/27/18 16:35	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/27/18 16:35	
1,1-Dichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
1,1-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,3-Trichloropropane	ug/kg	ND	200	03/27/18 16:35	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/27/18 16:35	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichloropropane	ug/kg	ND	50.0	03/27/18 16:35	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,3-Dichloropropane	ug/kg	ND	50.0	03/27/18 16:35	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
2,2-Dichloropropane	ug/kg	ND	200	03/27/18 16:35	
2-Butanone (MEK)	ug/kg	ND	250	03/27/18 16:35	
2-Chlorotoluene	ug/kg	ND	50.0	03/27/18 16:35	
4-Chlorotoluene	ug/kg	ND	50.0	03/27/18 16:35	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/27/18 16:35	
Acetone	ug/kg	ND	1000	03/27/18 16:35	
Allyl chloride	ug/kg	ND	200	03/27/18 16:35	
Benzene	ug/kg	ND	20.0	03/27/18 16:35	
Bromobenzene	ug/kg	ND	50.0	03/27/18 16:35	
Bromochloromethane	ug/kg	ND	50.0	03/27/18 16:35	
Bromodichloromethane	ug/kg	ND	50.0	03/27/18 16:35	
Bromoform	ug/kg	ND	200	03/27/18 16:35	
Bromomethane	ug/kg	ND	500	03/27/18 16:35	
Carbon tetrachloride	ug/kg	ND	50.0	03/27/18 16:35	
Chlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
Chloroethane	ug/kg	ND	500	03/27/18 16:35	
Chloroform	ug/kg	ND	50.0	03/27/18 16:35	
Chloromethane	ug/kg	ND	200	03/27/18 16:35	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

METHOD BLANK: 2872633 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/27/18 16:35	
Dibromomethane	ug/kg	ND	50.0	03/27/18 16:35	
Dichlorodifluoromethane	ug/kg	ND	200	03/27/18 16:35	
Dichlorofluoromethane	ug/kg	ND	500	03/27/18 16:35	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/27/18 16:35	
Ethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/27/18 16:35	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/27/18 16:35	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/27/18 16:35	
Methylene Chloride	ug/kg	ND	200	03/27/18 16:35	
n-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
n-Propylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Naphthalene	ug/kg	ND	200	03/27/18 16:35	
p-Isopropyltoluene	ug/kg	ND	50.0	03/27/18 16:35	
sec-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Styrene	ug/kg	ND	50.0	03/27/18 16:35	
tert-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Tetrachloroethene	ug/kg	ND	50.0	03/27/18 16:35	
Tetrahydrofuran	ug/kg	ND	2000	03/27/18 16:35	
Toluene	ug/kg	ND	50.0	03/27/18 16:35	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	
Trichloroethene	ug/kg	ND	50.0	03/27/18 16:35	N2
Trichlorofluoromethane	ug/kg	ND	200	03/27/18 16:35	
Vinyl chloride	ug/kg	ND	20.0	03/27/18 16:35	
Xylene (Total)	ug/kg	ND	150	03/27/18 16:35	
1,2-Dichloroethane-d4 (S)	%	91	75-125	03/27/18 16:35	
4-Bromofluorobenzene (S)	%	101	75-125	03/27/18 16:35	
Toluene-d8 (S)	%	98	75-125	03/27/18 16:35	

LABORATORY CONTROL SAMPLE & LCSD: 2872634

2872635

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	936	912	94	91	59-125	3	20	
1,1,1-Trichloroethane	ug/kg	1000	910	885	91	89	59-125	3	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	923	898	92	90	58-125	3	20	N2
1,1,2-Trichloroethane	ug/kg	1000	913	861	91	86	64-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	876	853	88	85	65-125	3	20	
1,1-Dichloroethane	ug/kg	1000	853	825	85	82	63-125	3	20	
1,1-Dichloroethene	ug/kg	1000	918	900	92	90	59-125	2	20	
1,1-Dichloropropene	ug/kg	1000	918	913	92	91	64-125	1	20	
1,2,3-Trichlorobenzene	ug/kg	1000	898	866	90	87	55-126	4	20	
1,2,3-Trichloropropane	ug/kg	1000	847	792	85	79	62-125	7	20	
1,2,4-Trichlorobenzene	ug/kg	1000	907	899	91	90	62-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

LABORATORY CONTROL SAMPLE & LCSD: 2872634		2872635									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,2,4-Trimethylbenzene	ug/kg	1000	895	876	90	88	59-125	2	20		
1,2-Dibromo-3-chloropropane	ug/kg	2500	2070	2030	83	81	54-125	2	20		
1,2-Dibromoethane (EDB)	ug/kg	1000	865	861	87	86	64-125	1	20		
1,2-Dichlorobenzene	ug/kg	1000	858	840	86	84	63-125	2	20		
1,2-Dichloroethane	ug/kg	1000	784	767	78	77	57-125	2	20		
1,2-Dichloropropane	ug/kg	1000	889	873	89	87	67-125	2	20		
1,3,5-Trimethylbenzene	ug/kg	1000	899	870	90	87	59-125	3	20		
1,3-Dichlorobenzene	ug/kg	1000	864	833	86	83	64-125	4	20		
1,3-Dichloropropane	ug/kg	1000	875	859	87	86	64-125	2	20		
1,4-Dichlorobenzene	ug/kg	1000	840	843	84	84	63-125	0	20		
2,2-Dichloropropane	ug/kg	1000	975	934	98	93	37-126	4	20		
2-Butanone (MEK)	ug/kg	5000	4040	4150	81	83	48-125	3	20		
2-Chlorotoluene	ug/kg	1000	870	844	87	84	62-125	3	20		
4-Chlorotoluene	ug/kg	1000	893	868	89	87	63-125	3	20		
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4230	4170	85	83	52-135	1	20		
Acetone	ug/kg	5000	5930	5540	119	111	65-125	7	20		
Allyl chloride	ug/kg	1000	861	838	86	84	52-125	3	20		
Benzene	ug/kg	1000	870	836	87	84	61-125	4	20		
Bromobenzene	ug/kg	1000	896	858	90	86	64-125	4	20		
Bromochloromethane	ug/kg	1000	902	848	90	85	65-125	6	20		
Bromodichloromethane	ug/kg	1000	956	912	96	91	57-125	5	20		
Bromoform	ug/kg	1000	857	861	86	86	57-125	0	20		
Bromomethane	ug/kg	1000	761	842	76	84	60-125	10	20		
Carbon tetrachloride	ug/kg	1000	936	894	94	89	58-125	5	20		
Chlorobenzene	ug/kg	1000	891	868	89	87	66-125	3	20		
Chloroethane	ug/kg	1000	808	861	81	86	62-125	6	20		
Chloroform	ug/kg	1000	780	773	78	77	59-125	1	20		
Chloromethane	ug/kg	1000	777	793	78	79	50-125	2	20		
cis-1,2-Dichloroethene	ug/kg	1000	871	844	87	84	61-125	3	20		
cis-1,3-Dichloropropene	ug/kg	1000	920	884	92	88	61-125	4	20		
Dibromochloromethane	ug/kg	1000	873	836	87	84	60-125	4	20		
Dibromomethane	ug/kg	1000	919	879	92	88	69-125	4	20		
Dichlorodifluoromethane	ug/kg	1000	692	727	69	73	38-125	5	20		
Dichlorofluoromethane	ug/kg	1000	781	830	78	83	67-125	6	20		
Diethyl ether (Ethyl ether)	ug/kg	1000	1440	1560	144	156	60-125	8	20 L3		
Ethylbenzene	ug/kg	1000	885	876	89	88	62-125	1	20		
Hexachloro-1,3-butadiene	ug/kg	1000	929	952	93	95	56-125	2	20		
Isopropylbenzene (Cumene)	ug/kg	1000	945	925	94	92	65-125	2	20		
Methyl-tert-butyl ether	ug/kg	1000	834	815	83	82	59-125	2	20		
Methylene Chloride	ug/kg	1000	905	859	91	86	64-125	5	20		
n-Butylbenzene	ug/kg	1000	931	914	93	91	59-125	2	20		
n-Propylbenzene	ug/kg	1000	920	887	92	89	61-125	4	20		
Naphthalene	ug/kg	1000	909	917	91	92	53-125	1	20		
p-Isopropyltoluene	ug/kg	1000	911	904	91	90	63-125	1	20		
sec-Butylbenzene	ug/kg	1000	937	918	94	92	62-125	2	20		
Styrene	ug/kg	1000	939	902	94	90	66-125	4	20		
tert-Butylbenzene	ug/kg	1000	914	898	91	90	64-125	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2872634		2872635			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Tetrachloroethene	ug/kg	1000	916	895	92	89	67-125	2	20	
Tetrahydrofuran	ug/kg	10000	12300	11600	123	116	62-125	6	20	
Toluene	ug/kg	1000	886	876	89	88	61-125	1	20	
trans-1,2-Dichloroethene	ug/kg	1000	901	885	90	89	64-125	2	20	
trans-1,3-Dichloropropene	ug/kg	1000	931	929	93	93	56-125	0	20	
Trichloroethene	ug/kg	1000	892	866	89	87	67-125	3	20	N2
Trichlorofluoromethane	ug/kg	1000	753	816	75	82	65-125	8	20	
Vinyl chloride	ug/kg	1000	851	883	85	88	57-125	4	20	
Xylene (Total)	ug/kg	3000	2710	2690	90	90	62-125	1	20	
1,2-Dichloroethane-d4 (S)	%				92	91	75-125			
4-Bromofluorobenzene (S)	%				100	102	75-125			
Toluene-d8 (S)	%				99	101	75-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529466 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873686 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDE	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDT	ug/kg	ND	3.3	04/05/18 18:14	
Aldrin	ug/kg	ND	1.7	04/05/18 18:14	
alpha-BHC	ug/kg	ND	1.7	04/05/18 18:14	
alpha-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
beta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Chlordane (Technical)	ug/kg	ND	16.7	04/05/18 18:14	
delta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Dieldrin	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan I	ug/kg	ND	1.7	04/05/18 18:14	
Endosulfan II	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan sulfate	ug/kg	ND	3.3	04/05/18 18:14	
Endrin	ug/kg	ND	3.3	04/05/18 18:14	
Endrin aldehyde	ug/kg	ND	3.3	04/05/18 18:14	
Endrin ketone	ug/kg	ND	3.3	04/05/18 18:14	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/05/18 18:14	
gamma-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor epoxide	ug/kg	ND	1.7	04/05/18 18:14	
Methoxychlor	ug/kg	ND	16.7	04/05/18 18:14	
Toxaphene	ug/kg	ND	50.0	04/05/18 18:14	
Decachlorobiphenyl (S)	%	95	30-150	04/05/18 18:14	
Tetrachloro-m-xylene (S)	%	91	30-150	04/05/18 18:14	

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.1	99	62-127	
4,4'-DDE	ug/kg	33.3	32.4	97	66-125	
4,4'-DDT	ug/kg	33.3	33.2	99	67-128	CH
Aldrin	ug/kg	16.7	14.5	87	66-125	
alpha-BHC	ug/kg	16.7	14.8	89	64-125	
alpha-Chlordane	ug/kg	16.7	15.2	91	68-125	
beta-BHC	ug/kg	16.7	15.3	92	69-125	
delta-BHC	ug/kg	16.7	9.8	59	42-133	
Dieldrin	ug/kg	33.3	33.7	101	69-126	
Endosulfan I	ug/kg	16.7	14.1	85	63-125	
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	27.6	83	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.1	93	69-125	
Endrin aldehyde	ug/kg	33.3	31.3	94	65-125	
Endrin ketone	ug/kg	33.3	34.0	102	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.3	92	67-125	
gamma-Chlordane	ug/kg	16.7	13.8	83	63-125	
Heptachlor	ug/kg	16.7	15.3	92	69-125	
Heptachlor epoxide	ug/kg	16.7	15.3	92	68-125	
Methoxychlor	ug/kg	167	165	99	65-134	CH
Decachlorobiphenyl (S)	%			90	30-150	
Tetrachloro-m-xylene (S)	%			86	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873688 2873689

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	166	166	147	154	89	93	56-125	5	20	
4,4'-DDE	ug/kg	ND	166	166	154	164	93	99	32-150	6	20	
4,4'-DDT	ug/kg	ND	166	166	154	158	93	95	60-132	2	20	CH
Aldrin	ug/kg	ND	82.5	83	61.8	64.2	75	78	56-125	4	20	
alpha-BHC	ug/kg	ND	82.5	83	74.1	80.9	90	98	54-136	9	20	
alpha-Chlordane	ug/kg	147	82.5	83	169	140	26	-9	54-133	19	20	M1
beta-BHC	ug/kg	64.3	82.5	83	79.8	87.9	19	28	30-150	10	20	M1
delta-BHC	ug/kg	ND	82.5	83	49.8	54.9	60	66	45-145	10	20	
Dieldrin	ug/kg	ND	166	166	142	143	86	86	47-150	0	20	
Endosulfan I	ug/kg	ND	82.5	83	66.2	70.2	80	85	35-145	6	20	
Endosulfan II	ug/kg	ND	166	166	139	142	84	86	50-147	2	20	
Endosulfan sulfate	ug/kg	ND	166	166	118	120	71	73	54-132	2	20	
Endrin	ug/kg	ND	166	166	126	128	76	78	62-125	2	20	
Endrin aldehyde	ug/kg	ND	166	166	132	132	80	80	33-150	1	20	
Endrin ketone	ug/kg	ND	166	166	144	146	87	88	56-144	1	20	
gamma-BHC (Lindane)	ug/kg	ND	82.5	83	66.3	68.3	80	82	63-125	3	20	
gamma-Chlordane	ug/kg	129	82.5	83	141	118	14	-14	45-132	18	20	M1
Heptachlor	ug/kg	ND	82.5	83	77.5	95.3	94	115	51-142	21	20	R1
Heptachlor epoxide	ug/kg	ND	82.5	83	65.2	69.5	79	84	50-142	6	20	
Methoxychlor	ug/kg	ND	825	830	810	820	98	99	58-139	1	20	CH
Decachlorobiphenyl (S)	%						60	64	30-150			
Tetrachloro-m-xylene (S)	%						57	64	30-150			4M,D4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529467 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2873690 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/02/18 10:11	
Decachlorobiphenyl (S)	%.	88	30-134	04/02/18 10:11	
Tetrachloro-m-xylene (S)	%.	88	48-125	04/02/18 10:11	

LABORATORY CONTROL SAMPLE: 2873691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	569	85	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	575	86	62-125	
Decachlorobiphenyl (S)	%.			90	30-134	
Tetrachloro-m-xylene (S)	%.			90	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873692 2873693

Parameter	Units	10424793002		2873692		2873693		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
PCB-1016 (Aroclor 1016)	ug/kg	ND	930	930	789	769	85	83	30-150	3	30			
PCB-1260 (Aroclor 1260)	ug/kg	ND	930	930	906	896	97	96	30-138	1	30			
Decachlorobiphenyl (S)	%.						77	74	30-134					
Tetrachloro-m-xylene (S)	%.						76	69	48-125					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529268 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2872570 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Diphenylhydrazine	ug/kg	ND	330	03/30/18 11:47	
1,3-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,4-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2,4,5-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dimethylphenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2,6-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2-Chloronaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Chlorophenol	ug/kg	ND	330	03/30/18 11:47	
2-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	03/30/18 11:47	
2-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
2-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	03/30/18 11:47	
3,3'-Dichlorobenzidine	ug/kg	ND	330	03/30/18 11:47	
3-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	03/30/18 11:47	
4-Bromophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Chloro-3-methylphenol	ug/kg	ND	330	03/30/18 11:47	
4-Chloroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Chlorophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
Acenaphthene	ug/kg	ND	330	03/30/18 11:47	
Acenaphthylene	ug/kg	ND	330	03/30/18 11:47	
Anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)pyrene	ug/kg	ND	330	03/30/18 11:47	
Benzo(b)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Benzo(g,h,i)perylene	ug/kg	ND	330	03/30/18 11:47	
Benzo(k)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	03/30/18 11:47	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

METHOD BLANK: 2872570

Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	03/30/18 11:47	
Carbazole	ug/kg	ND	330	03/30/18 11:47	
Chrysene	ug/kg	ND	330	03/30/18 11:47	
Di-n-butylphthalate	ug/kg	ND	330	03/30/18 11:47	
Di-n-octylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dibenz(a,h)anthracene	ug/kg	ND	330	03/30/18 11:47	
Dibenzofuran	ug/kg	ND	330	03/30/18 11:47	
Diethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dimethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Fluorene	ug/kg	ND	330	03/30/18 11:47	
Hexachloro-1,3-butadiene	ug/kg	ND	330	03/30/18 11:47	
Hexachlorobenzene	ug/kg	ND	330	03/30/18 11:47	
Hexachloroethane	ug/kg	ND	330	03/30/18 11:47	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	03/30/18 11:47	
Isophorone	ug/kg	ND	330	03/30/18 11:47	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodimethylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodiphenylamine	ug/kg	ND	330	03/30/18 11:47	
Naphthalene	ug/kg	ND	330	03/30/18 11:47	
Nitrobenzene	ug/kg	ND	330	03/30/18 11:47	
Pentachlorophenol	ug/kg	ND	670	03/30/18 11:47	
Phenanthrene	ug/kg	ND	330	03/30/18 11:47	
Phenol	ug/kg	ND	330	03/30/18 11:47	
Pyrene	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Tribromophenol (S)	%	73	60-125	03/30/18 11:47	
2-Fluorobiphenyl (S)	%	58	30-132	03/30/18 11:47	
2-Fluorophenol (S)	%	55	40-125	03/30/18 11:47	
Nitrobenzene-d5 (S)	%	54	43-125	03/30/18 11:47	
p-Terphenyl-d14 (S)	%	90	62-125	03/30/18 11:47	
Phenol-d6 (S)	%	56	48-125	03/30/18 11:47	

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1020	61	46-125	
1,2-Dichlorobenzene	ug/kg	1670	999	60	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1310	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1010	61	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1010	61	39-125	
1-Methylnaphthalene	ug/kg	1670	1080	65	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1220	73	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1200	72	61-125	
2,4-Dichlorophenol	ug/kg	1670	1060	64	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1030	62	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1250	75	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1240	74	63-125	
2-Chloronaphthalene	ug/kg	1670	1130	68	61-125	
2-Chlorophenol	ug/kg	1670	1020	61	46-125	
2-Methylnaphthalene	ug/kg	1670	1080	65	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1080	65	50-125	
2-Nitroaniline	ug/kg	1670	1380	83	61-125	
2-Nitrophenol	ug/kg	1670	1030	62	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1080	65	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1290	78	47-125	
3-Nitroaniline	ug/kg	1670	1220	73	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1380J	83	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1350	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1180	71	64-125	
4-Chloroaniline	ug/kg	1670	944	57	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1210	73	64-125	
4-Nitroaniline	ug/kg	1670	1180	71	59-125	
4-Nitrophenol	ug/kg	1670	1320	79	54-125	
Acenaphthene	ug/kg	1670	1190	72	62-125	
Acenaphthylene	ug/kg	1670	1140	69	61-125	
Anthracene	ug/kg	1670	1280	77	66-125	
Benzo(a)anthracene	ug/kg	1670	1300	78	69-125	
Benzo(a)pyrene	ug/kg	1670	1310	79	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1380	83	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1320	79	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1300	78	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1120	67	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1090	65	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1180	71	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1330	80	69-131	
Butylbenzylphthalate	ug/kg	1670	1340	81	69-129	
Carbazole	ug/kg	1670	1290	77	66-125	
Chrysene	ug/kg	1670	1300	78	68-125	
Di-n-butylphthalate	ug/kg	1670	1360	81	69-125	
Di-n-octylphthalate	ug/kg	1670	1310	79	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1340	81	64-125	
Dibenzofuran	ug/kg	1670	1200	72	65-125	
Diethylphthalate	ug/kg	1670	1280	77	67-125	
Dimethylphthalate	ug/kg	1670	1240	75	67-125	
Fluoranthene	ug/kg	1670	1280	77	66-125	
Fluorene	ug/kg	1670	1190	71	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1040	62	40-125	
Hexachlorobenzene	ug/kg	1670	1320	79	62-125	
Hexachloroethane	ug/kg	1670	1010	61	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1320	79	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1130	68	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1150	69	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1090	65	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1320	79	65-125	
Naphthalene	ug/kg	1670	1050	63	48-125	
Nitrobenzene	ug/kg	1670	1130	68	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1300	78	66-125	
Phenol	ug/kg	1670	1110	67	46-125	
Pyrene	ug/kg	1670	1360	82	69-125	
2,4,6-Tribromophenol (S)	%			85	60-125	
2-Fluorobiphenyl (S)	%			76	30-132	
2-Fluorophenol (S)	%			69	40-125	
Nitrobenzene-d5 (S)	%			71	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			72	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788 2872789

Parameter	Units	10424792001		MSD		MSD		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,2,4-Trichlorobenzene	ug/kg	ND	1720	1710	1460J	1420J	85	83	30-127		30		
1,2-Dichlorobenzene	ug/kg	ND	1720	1710	1360J	1370J	79	80	30-125		30		
1,2-Diphenylhydrazine	ug/kg	ND	1720	1710	1710	1620J	100	95	30-150		30		
1,3-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1320J	82	77	30-125		30		
1,4-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1350J	82	79	30-125		30		
1-Methylnaphthalene	ug/kg	ND	1720	1710	1540J	1510J	90	88	42-125		30		
2,4,5-Trichlorophenol	ug/kg	ND	1720	1710	1470J	1350J	86	79	30-150		30		
2,4,6-Trichlorophenol	ug/kg	ND	1720	1710	1330J	1320J	78	77	30-150		30		
2,4-Dichlorophenol	ug/kg	ND	1720	1710	1550J	1480J	91	87	30-135		30		
2,4-Dimethylphenol	ug/kg	ND	1720	1710	1440J	1430J	84	84	30-148		30		
2,4-Dinitrophenol	ug/kg	ND	1720	1710	ND	ND	5	4	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	1720	1710	1560J	1560J	91	92	30-150		30		
2,6-Dinitrotoluene	ug/kg	ND	1720	1710	1650J	1720	96	100	30-150		30		
2-Chloronaphthalene	ug/kg	ND	1720	1710	1580J	1500J	92	88	30-138		30		
2-Chlorophenol	ug/kg	ND	1720	1710	1500J	1450J	88	85	30-130		30		
2-Methylnaphthalene	ug/kg	ND	1720	1710	1530J	1640J	89	96	46-125		30		
2-Methylphenol(o-Cresol)	ug/kg	ND	1720	1710	1590J	1490J	93	87	30-133		30		
2-Nitroaniline	ug/kg	ND	1720	1710	1650J	1750	97	103	30-150		30		
2-Nitrophenol	ug/kg	ND	1720	1710	1360J	1410J	79	83	30-134		30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1720	1710	1600J	1590J	94	93	30-138		30		
3,3'-Dichlorobenzidine	ug/kg	ND	1720	1710	1340J	1500J	78	88	30-149		30	5M	
3-Nitroaniline	ug/kg	ND	1720	1710	1300J	1180J	76	69	30-150		30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	1720	1710	ND	ND	19	20	30-133		30	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788												2872789			
Parameter	Units	MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual	
		10424792001	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
4-Bromophenylphenyl ether	ug/kg	ND	1720	1710	1670J	1600J	97	94	44-125				30		
4-Chloro-3-methylphenol	ug/kg	ND	1720	1710	1580J	ND	92	99	30-150				30		
4-Chloroaniline	ug/kg	ND	1720	1710	1010J	930J	59	54	30-125				30		
4-Chlorophenylphenyl ether	ug/kg	ND	1720	1710	1630J	1540J	95	90	44-125				30		
4-Nitroaniline	ug/kg	ND	1720	1710	1500J	1440J	87	84	30-150				30		
4-Nitrophenol	ug/kg	ND	1720	1710	1450J	1370J	85	80	30-150				30		
Acenaphthene	ug/kg	ND	1720	1710	1490J	1430J	87	84	40-125				30		
Acenaphthylene	ug/kg	ND	1720	1710	1560J	1470J	91	86	30-150				30		
Anthracene	ug/kg	ND	1720	1710	1770	1800	103	106	30-150	2			30		
Benzo(a)anthracene	ug/kg	ND	1720	1710	1970	1970	115	115	30-150	0			30		
Benzo(a)pyrene	ug/kg	ND	1720	1710	1860	1850	109	108	30-150	1			30		
Benzo(b)fluoranthene	ug/kg	ND	1720	1710	1560J	1770	91	104	30-150				30		
Benzo(g,h,i)perylene	ug/kg	ND	1720	1710	1600J	1710	93	100	30-150				30		
Benzo(k)fluoranthene	ug/kg	ND	1720	1710	1660J	1550J	97	91	30-150				30		
bis(2-Chloroethoxy)methane	ug/kg	ND	1720	1710	1520J	1460J	89	85	30-134				30		
bis(2-Chloroethyl) ether	ug/kg	ND	1720	1710	1570J	1550J	91	91	30-125				30	5M	
bis(2-Chloroisopropyl) ether	ug/kg	ND	1720	1710	1780	1600J	104	94	30-125				30	5M	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1720	1710	1780	1880	104	110	30-150	5			30		
Butylbenzylphthalate	ug/kg	ND	1720	1710	1740	1790	102	105	30-150	3			30		
Carbazole	ug/kg	ND	1720	1710	1660J	1710	97	100	41-125				30		
Chrysene	ug/kg	ND	1720	1710	2070	2030	121	119	30-150	2			30		
Di-n-butylphthalate	ug/kg	ND	1720	1710	1730	1740	101	102	30-150	0			30		
Di-n-octylphthalate	ug/kg	ND	1720	1710	1840	1870	108	110	30-150	2			30		
Dibenz(a,h)anthracene	ug/kg	ND	1720	1710	1540J	1680J	90	98	30-150				30		
Dibenzofuran	ug/kg	ND	1720	1710	1620J	1590J	95	93	45-125				30		
Diethylphthalate	ug/kg	ND	1720	1710	1680J	1660J	98	97	30-150				30		
Dimethylphthalate	ug/kg	ND	1720	1710	1650J	1630J	97	96	30-150				30		
Fluoranthene	ug/kg	ND	1720	1710	1750	1740	102	102	30-150	0			30		
Fluorene	ug/kg	ND	1720	1710	1620J	1660J	95	97	30-150				30		
Hexachloro-1,3-butadiene	ug/kg	ND	1720	1710	1380J	1460J	80	86	30-128				30		
Hexachlorobenzene	ug/kg	ND	1720	1710	1500J	1500J	87	88	30-150				30		
Hexachloroethane	ug/kg	ND	1720	1710	1440J	1350J	84	79	30-125				30		
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1720	1710	1500J	1650J	88	97	30-150				30		
Isophorone	ug/kg	ND	1720	1710	1570J	1550J	92	91	30-140				30		
N-Nitroso-di-n-propylamine	ug/kg	ND	1720	1710	1680J	1570J	98	92	30-147				30	5M	
N-Nitrosodimethylamine	ug/kg	ND	1720	1710	1420J	1330J	83	78	30-125				30		
N-Nitrosodiphenylamine	ug/kg	ND	1720	1710	1610J	1720	94	101	30-150				30		
Naphthalene	ug/kg	ND	1720	1710	1520J	1480J	89	86	44-125				30		
Nitrobenzene	ug/kg	ND	1720	1710	1580J	1550J	92	91	30-136				30		
Pentachlorophenol	ug/kg	ND	1720	1710	ND	ND	23	22	30-150				30	M1	
Phenanthrene	ug/kg	ND	1720	1710	1890	1950	110	114	30-150	3			30		
Phenol	ug/kg	ND	1720	1710	1530J	1490J	89	87	30-129				30		
Pyrene	ug/kg	ND	1720	1710	2160	2260	126	132	30-150	4			30		
2,4,6-Tribromophenol (S)	%						86	83	60-125						
2-Fluorobiphenyl (S)	%						98	95	30-132						
2-Fluorophenol (S)	%						95	88	40-125						

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2872788		2872789		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					93	93	43-125			
p-Terphenyl-d14 (S)	%.					97	103	62-125			
Phenol-d6 (S)	%.					95	93	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529263 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2872540 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/02/18 12:14	
Acenaphthylene	ug/kg	ND	10.0	04/02/18 12:14	
Anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(a)anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(a)pyrene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Chrysene	ug/kg	ND	10.0	04/02/18 12:14	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Fluorene	ug/kg	ND	10.0	04/02/18 12:14	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/02/18 12:14	
Naphthalene	ug/kg	ND	10.0	04/02/18 12:14	
Phenanthrene	ug/kg	ND	10.0	04/02/18 12:14	
Pyrene	ug/kg	ND	10.0	04/02/18 12:14	
2-Fluorobiphenyl (S)	%	84	42-125	04/02/18 12:14	
p-Terphenyl-d14 (S)	%	100	57-125	04/02/18 12:14	

LABORATORY CONTROL SAMPLE: 2872541

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.2	73	52-125	
Acenaphthylene	ug/kg	33.3	26.1	78	50-125	
Anthracene	ug/kg	33.3	30.0	90	65-125	
Benzo(a)anthracene	ug/kg	33.3	31.8	95	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.2	90	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.1	93	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	26.3	79	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.3	88	67-125	
Chrysene	ug/kg	33.3	28.6	86	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	25.8	77	63-125	
Fluoranthene	ug/kg	33.3	30.2	91	75-125	
Fluorene	ug/kg	33.3	25.3	76	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	26.4	79	63-125	
Naphthalene	ug/kg	33.3	26.1	78	49-125	
Phenanthrene	ug/kg	33.3	25.1	75	65-125	
Pyrene	ug/kg	33.3	31.2	94	64-125	
2-Fluorobiphenyl (S)	%			78	42-125	
p-Terphenyl-d14 (S)	%			97	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2872542		2872543		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424778001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	36.5	36.6	27.7J	25.3J	76	69	30-125		30		
Acenaphthylene	ug/kg	ND	36.5	36.6	74.3J	57.6J	203	157	30-133		30	M1	
Anthracene	ug/kg	ND	36.5	36.6	76.5J	62.4J	209	170	30-150		30	M1	
Benzo(a)anthracene	ug/kg	ND	36.5	36.6	117	64.1J	319	175	30-150		30	M1	
Benzo(a)pyrene	ug/kg	ND	36.5	36.6	205	148	559	404	30-150	32	30	M1, R1	
Benzo(b)fluoranthene	ug/kg	ND	36.5	36.6	201	135	551	370	30-150	39	30	M1, R1	
Benzo(g,h,i)perylene	ug/kg	0.16 mg/kg	36.5	36.6	275	218	317	158	30-150	23	30	M1	
Benzo(k)fluoranthene	ug/kg	ND	36.5	36.6	94.9J	67.8J	260	185	30-150		30	M1	
Chrysene	ug/kg	ND	36.5	36.6	148	83.8J	406	229	30-150		30	M1	
Dibenz(a,h)anthracene	ug/kg	ND	36.5	36.6	80.8J	61.4J	221	168	30-131		30	M1	
Fluoranthene	ug/kg	ND	36.5	36.6	139	80.6J	380	220	30-150		30	M1	
Fluorene	ug/kg	ND	36.5	36.6	32J	26.3J	88	72	30-147		30		
Indeno(1,2,3-cd)pyrene	ug/kg	ND	36.5	36.6	169	125	463	342	30-150	30	30	M1	
Naphthalene	ug/kg	ND	36.5	36.6	25.2J	22.3J	69	61	30-131		30		
Phenanthrene	ug/kg	ND	36.5	36.6	41.7J	34.5J	114	94	30-150		30		
Pyrene	ug/kg	ND	36.5	36.6	139	74.2J	381	202	30-150		30	M1	
2-Fluorobiphenyl (S)	%.						82	71	42-125				P3
p-Terphenyl-d14 (S)	%.						74	66	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529569 Analysis Method: EPA 8270D
QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2874519 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 13:35	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 13:35	
2,4-D	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DB	mg/kg	ND	0.033	04/04/18 13:35	
Bentazon	mg/kg	ND	0.033	04/04/18 13:35	
Dicamba	mg/kg	ND	0.033	04/04/18 13:35	
Dinoseb	mg/kg	ND	0.033	04/04/18 13:35	
MCPA	mg/kg	ND	0.033	04/04/18 13:35	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 13:35	
Picloram	mg/kg	ND	0.033	04/04/18 13:35	
Triclopyr	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DCAA (S)	%	78	46-125	04/04/18 13:35	

LABORATORY CONTROL SAMPLE: 2874520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.28	83	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	79	61-125	
2,4-D	mg/kg	.33	0.29	86	63-125	
2,4-DB	mg/kg	.33	0.28	83	59-125	
Bentazon	mg/kg	.33	0.25	76	58-125	
Dicamba	mg/kg	.33	0.27	80	52-125	
Dinoseb	mg/kg	.33	0.18	53	35-126	
MCPA	mg/kg	.33	0.27	82	57-125	
Pentachlorophenol	mg/kg	.33	0.21	63	48-125	
Picloram	mg/kg	.33	0.24	72	47-125	
Triclopyr	mg/kg	.33	0.28	83	68-125	
2,4-DCAA (S)	%			77	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521 2874522

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10425111006 Result	Spike Conc.	Spike Conc.	MS Result						
2,4,5-T	mg/kg	ND	.45	.45	0.19	0.21	42	45	30-145	8	20
2,4,5-TP (Silvex)	mg/kg	ND	.45	.45	0.28	0.26	63	58	30-130	7	20
2,4-D	mg/kg	ND	.45	.45	0.18	0.20	40	44	30-150	9	20
2,4-DB	mg/kg	ND	.45	.45	0.35	0.33	77	72	45-126	7	20
Bentazon	mg/kg	ND	.45	.45	0.33	0.32	73	71	30-133	3	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Parameter	Units	2874521		2874522		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10425111006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dicamba	mg/kg	ND	.45	.45	0.13	0.17	29	38	30-140	28	20	M1, R1	
Dinoseb	mg/kg	ND	.45	.45	0.39	0.31	86	69	30-136	23	20	R1	
MCPA	mg/kg	ND	.45	.45	0.24	0.22	53	49	30-136	9	20		
Pentachlorophenol	mg/kg	ND	.45	.45	0.28	0.25	63	55	44-125	13	20		
Picloram	mg/kg	ND	.45	.45	.016J	0.098	3	22	30-125		20	M1	
Triclopyr	mg/kg	ND	.45	.45	0.23	0.22	51	50	30-149	3	20		
2,4-DCAA (S)	%.						65	60	46-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 529271 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 2872598 Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/30/18 13:11	
n-Triacontane (S)	%.	83	50-150	03/30/18 13:11	

LABORATORY CONTROL SAMPLE & LCSD: 2872599 2872600

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	68.2	73.5	85	92	70-120	8	20	
n-Triacontane (S)	%.				85	78	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 435589

Analysis Method: EPA 7196A

QC Batch Method: EPA 3060A

Analysis Description: 7196 Chromium, Hexavalent

Associated Lab Samples: 10424793003

METHOD BLANK: 2011612

Matrix: Solid

Associated Lab Samples: 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/06/18 13:03	

LABORATORY CONTROL SAMPLE: 2011613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1010	916	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011628 2011629

Parameter	Units	50192674008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1130	1120	1050	1050	93	94	75-125	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011630 2011631

Parameter	Units	50192674008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	45.7	45.5	45.3	45.5	99	100	75-125	0	20	

SAMPLE DUPLICATE: 2011632

Parameter	Units	40166807001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	<71.3	ND		20	D3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 285232 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 1669245 Matrix: Solid
Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/05/18 14:27	

LABORATORY CONTROL SAMPLE: 1669246

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669247 1669248

Parameter	Units	40166647001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.10J	2.5	2.5	2.3	2.5	88	96	80-120	7	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669249 1669250

Parameter	Units	40166870001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.16J	2.37	2.49	2.4	2.3	94	89	80-120	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

QC Batch: 139994

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10424793001, 10424793002, 10424793003

METHOD BLANK: 554472

Matrix: Solid

Associated Lab Samples: 10424793001, 10424793002, 10424793003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/05/18 17:16	

LABORATORY CONTROL SAMPLE: 554471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	49.8	51.6	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 554473

554474

Parameter	Units	10424793002		554473		554474		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Fluoride	mg/kg	1.7	50	49	23.2	28.0	43	54	80-120	19	20 M1

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

BATCH QUALIFIERS

Batch: 435998

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.

2M Sample was black in color. Sample needed to be centrifuged and decanted prior to analysis.

3M Sample was brown in color. Sample was centrifuged and decanted prior to analysis.

4M Sample was yellow in color.

5M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

C0 Result confirmed by second analysis.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

ANALYTE QUALIFIERS

- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- T6 High boiling point hydrocarbons are present in the sample.
- T7 Low boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424793001	FD-SB-A3-S (30-35)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10424793002	FD-SB-B3-WM (5-26)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10424793003	FD-SB-C3-WM (5-20)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10424793001	FD-SB-A3-S (30-35)	EPA 3550	529466	EPA 8081B	530402
10424793002	FD-SB-B3-WM (5-26)	EPA 3550	529466	EPA 8081B	530402
10424793003	FD-SB-C3-WM (5-20)	EPA 3550	529466	EPA 8081B	530402
10424793001	FD-SB-A3-S (30-35)	EPA 3550	529467	EPA 8082A	530082
10424793002	FD-SB-B3-WM (5-26)	EPA 3550	529467	EPA 8082A	530082
10424793003	FD-SB-C3-WM (5-20)	EPA 3550	529467	EPA 8082A	530082
10424793001	FD-SB-A3-S (30-35)	WI MOD DRO	529271	WI MOD DRO	529930
10424793002	FD-SB-B3-WM (5-26)	WI MOD DRO	529271	WI MOD DRO	529930
10424793003	FD-SB-C3-WM (5-20)	WI MOD DRO	529271	WI MOD DRO	529930
10424793001	FD-SB-A3-S (30-35)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424793002	FD-SB-B3-WM (5-26)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424793003	FD-SB-C3-WM (5-20)	EPA 5030 Medium Soil	529815	WI MOD GRO	530199
10424793001	FD-SB-A3-S (30-35)	EPA 3050	529339	EPA 6010C	529383
10424793002	FD-SB-B3-WM (5-26)	EPA 3050	529339	EPA 6010C	529383
10424793003	FD-SB-C3-WM (5-20)	EPA 3050	529339	EPA 6010C	529383
10424793001	FD-SB-A3-S (30-35)	EPA 3050B	435596	EPA 6020	435837
10424793002	FD-SB-B3-WM (5-26)	EPA 3050B	435596	EPA 6020	435837
10424793003	FD-SB-C3-WM (5-20)	EPA 3050B	435596	EPA 6020	435837
10424793001	FD-SB-A3-S (30-35)	EPA 3050	529341	EPA 6020A	529455
10424793002	FD-SB-B3-WM (5-26)	EPA 3050	529341	EPA 6020A	529455
10424793003	FD-SB-C3-WM (5-20)	EPA 3050	529341	EPA 6020A	529455
10424793001	FD-SB-A3-S (30-35)	EPA 7471	529342	EPA 7471	529917
10424793002	FD-SB-B3-WM (5-26)	EPA 7471	529342	EPA 7471	529917
10424793003	FD-SB-C3-WM (5-20)	EPA 7471	529342	EPA 7471	529917
10424793001	FD-SB-A3-S (30-35)	ASTM D2974	529398		
10424793002	FD-SB-B3-WM (5-26)	ASTM D2974	529398		
10424793003	FD-SB-C3-WM (5-20)	ASTM D2974	529398		
10424793001	FD-SB-A3-S (30-35)	EPA 3550	529268	EPA 8270D	529887
10424793002	FD-SB-B3-WM (5-26)	EPA 3550	529268	EPA 8270D	529887
10424793003	FD-SB-C3-WM (5-20)	EPA 3550	529268	EPA 8270D	529887
10424793001	FD-SB-A3-S (30-35)	EPA 3550	529263	EPA 8270D by SIM	530180
10424793002	FD-SB-B3-WM (5-26)	EPA 3550	529263	EPA 8270D by SIM	530180
10424793003	FD-SB-C3-WM (5-20)	EPA 3550	529263	EPA 8270D by SIM	530180
10424793001	FD-SB-A3-S (30-35)	EPA 3546	529569	EPA 8270D	530638
10424793002	FD-SB-B3-WM (5-26)	EPA 3546	529569	EPA 8270D	530638
10424793003	FD-SB-C3-WM (5-20)	EPA 3546	529569	EPA 8270D	530638
10424793001	FD-SB-A3-S (30-35)	EPA 5035/5030B	529276	EPA 8260B	529485
10424793002	FD-SB-B3-WM (5-26)	EPA 5035/5030B	529276	EPA 8260B	529485
10424793003	FD-SB-C3-WM (5-20)	EPA 5035/5030B	529276	EPA 8260B	529485

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Solids

Pace Project No.: 10424793

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424793003	FD-SB-C3-WM (5-20)	EPA 3060A	435589	EPA 7196A	435998
10424793003	FD-SB-C3-WM (5-20)	Trivalent Chromium Calculation	436173		
10424793001	FD-SB-A3-S (30-35)	EPA 9012A	285232	EPA 9012	285274
10424793002	FD-SB-B3-WM (5-26)	EPA 9012A	285232	EPA 9012	285274
10424793003	FD-SB-C3-WM (5-20)	EPA 9012A	285232	EPA 9012	285274
10424793001	FD-SB-A3-S (30-35)	EPA 300.0	139994	EPA 9056A	140024
10424793002	FD-SB-B3-WM (5-26)	EPA 300.0	139994	EPA 9056A	140024
10424793003	FD-SB-C3-WM (5-20)	EPA 300.0	139994	EPA 9056A	140024

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WO#: 10424793



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

COC Type: 10424793

Turnaround Time:

COC ID:

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: *MPCA - Freeway LF Solids* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA - Freeway LF Solids* Project Task Code:

Address: *18-00383
EPIC Profile #38716*

Project Manager:

Phone No:

Potential Hazard? If yes, add information to Sampler Comments Section

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
Wt-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	Lab Sample No.	#	
<i>FD-SB-A3 S (31-33)</i>	<i>S</i>	<i>3/23/18</i>	<i>12:30</i>	<i>30</i>	<i>35</i>	<i>C</i>	<i>SD</i>					<i>see attached for soils/waste (-Dioxins)</i>									<i>001</i>	<i>1</i>
<i>FD-SB-B3 -WM (5-30)</i>	<i>S</i>	<i>3/23/18</i>	<i>13:30</i>	<i>5</i>	<i>26</i>	<i>C</i>	<i>SD</i>					<i>X</i>									<i>002</i>	<i>2</i>
<i>FD-SB-C3 -WM (5-30)</i>	<i>S</i>	<i>3/23/18</i>	<i>14:30</i>	<i>5</i>	<i>20</i>	<i>C</i>	<i>SD</i>					<i>X</i>									<i>003</i>	<i>3</i>
																						<i>4</i>
																						<i>5</i>
																						<i>6</i>
																						<i>7</i>
																						<i>8</i>
																						<i>9</i>
																						<i>10</i>

Sampled By: *David Anderson* Sampler's Signature: *David Anderson* Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / Pace</i>	<i>3/23/18 / 1600</i>	<i>Matt Pace</i>	<i>3/23/18 / 1600</i>

T=5.4



Sample Condition Upon Receipt

Client Name: MPCA - FSD Project #: WO# : 10424793

WO# : 10424793

PM: BM2 Due Date: 04/06/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 5.2 Cooler Temp Corrected (°C): 5.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: 3-23-18 JDD

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Chain of Custody

WO#: 12106658

 12106658

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424793 Workorder Name: 18-00383 MPCA FreewayLF Solids Owner Received Date: 3/23/2018 Results Requested By: 4/6/2018

Report To		Subcontract To				Requested Analysis																														
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				<div style="display: flex; justify-content: space-between;"> Fluoride by 9056 LAB USE ONLY </div>																														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													Preserved Containers																		
																		Unpreserved																		
1	FD-SB-A3-S (30-35)	PS	3/23/2018 12:30	10424793001	Solid													1																		
2	FD-SB-B3-WM (5-26)	PS	3/23/2018 13:30	10424793002	Solid													1																		
3	FD-SB-C3-WM (5-20)	PS	3/23/2018 14:30	10424793003	Solid	1																														
4																																				
5																																				
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																														
1		<i>Mary Veld Pace</i>	<i>4/03/18 1545</i>	<i>B. Mathew</i>	<i>4/4/18 0935</i>																															
2																																				
3																																				
Cooler Temperature on Receipt		<i>2.1</i> °C	Custody Seal		<i>Y</i> or N	Received on Ice		<i>Y</i> or N	Samples Intact													<i>Y</i> or N														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace Mpls

Project #:

WO# : 12106658
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.8 Cooler Temp Corrected °C: 1.1 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: Bm 4/4/18

Comments: _____

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 4/4/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO#: 12106658

PM: HRZ Due Date: 04/06/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 3.7 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/4/18 

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):			

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Date: 4/4/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

SSM

40166966



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424793 Workorder Name: 18-00383 MPCA FreewayLF Solids Owner Received Date: 3/23/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis													
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436					Cyanide by EPA 9012													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Preserved Containers				LAB USE ONLY									
1	FD-SB-A3-S (30-35) 001	PS	3/23/2018 12:30	10424793001	Solid	1					X									
2	FD-SB-B3-WM (5-26) 002	PS	3/23/2018 13:30	10424793002	Solid	1					X									
3	FD-SB-C3-WM (5-20) 003	PS	3/23/2018 14:30	10424793003	Solid	1					X									
4																				
5																				
Transfers												Comments								
Released By	Date/Time	Received By	Date/Time																	
1	W. J. Pace	4/03/18 1700																		
2	W. J. Pace	4-5-18 0840	Sumit Kumar	4-5-18 0840																
3																				
Cooler Temperature on Receipt		64 °C	Custody Seal		(Y) or N	Received on Ice		(Y) or N	Samples Intact											(Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

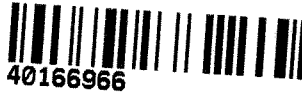
Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN

Project #: _____

WO#: 40166966

Courier: CS Logistics Fed Ex Speedee UPS Waitco
 Client Pace Other: _____



Tracking #: 1682502

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 4 Type of Ice: Wet Blue Dry None

Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 4.5 / Corr: 4

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:
Date: 4-5-18
Initials: SW

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7. <u>4-6-18 TAT</u>
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8. <u>4-5-18 SW</u>
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

If checked, see attached form for additional comments

Comments/ Resolution: No collect times on original labels.

4-5-18 SW

Project Manager Review: [Signature]

Date: 4/5/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193607

Date/Time and Initials of person examining contents: TR 4/4/16 0920

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 9867

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 30/3.3 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

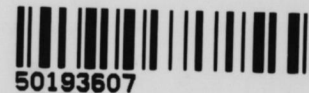
All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			<input checked="" type="checkbox"/>
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
Rush TAT Requested: <u>4/6/16</u>	<input checked="" type="checkbox"/>		Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Sample Labels Match COC?: Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
			Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments: _____

Sample Container Count

WO#: 50193607



CLIENT: Page MW

COC PAGE 1 of 1

COC ID# _____

Project # 50193607

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Bulk Kit	Matrix SI (Soil/Wa Aqueous)	pH <2	pH >9	pH >12
1								1												5		
2								1												1		
3								1														
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG9U	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Page 70 of 70

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

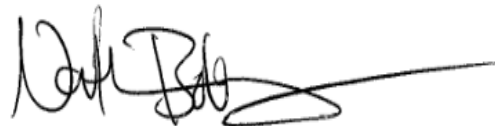
Pace Project #: 10424795
Sample Receipt Date: 03/23/2018
Client Project #: MPCA-Freeway LF Soli
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 05, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 5, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of Pace Analytical Services, Inc. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 66%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 102%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10424795



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number: COCT 10424795
Turnaround Time: COC ID:

PROJECT/CLIENT INFO		LABORATORY	
Facility Code: <i>MPCA - Freeway LF Solids</i>	Program Code (MDH Lab Only):	Lab Name:	
Project Name: <i>MPCA - Freeway LF Solids</i>	Project Task Code:	Address: <i>18-00383</i>	
Project Manager:		<i>EPIC Profile #38716</i>	
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

ONLY
Lab Work Order Sticker

SAMPLE DETAILS										ANALYSIS REQUESTED																			
SAMPLE TYPE CODES					LAB MATRIX CODES					FIELD MATRIX CODES					PRESERV.														
Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample					QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB= Trip Blank Sample					DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe AR=Air BL=Biological Material OT=Other TS=Tissue					Wu-Ground=Groundwater Wu-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample														
Location Identifier	Sample Type	Date	Time	Start Depth (feet)	End Depth (feet)	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS REQUESTED										Lab Sample No.	#						
<i>FD-SB-A3 (S-31-33)</i>	<i>S</i>	<i>3/23/18</i>	<i>13:30</i>	<i>30</i>	<i>35</i>	<i>C</i>	<i>SD</i>					<i>See attached for soils/waste (-Dioxins)</i>											<i>1</i>						
<i>FD-SB-B3 (WM C5-30)</i>	<i>S</i>	<i>3/23/18</i>	<i>13:30</i>	<i>5</i>	<i>26</i>	<i>C</i>	<i>SD</i>					<i>+Dioxins</i>										<i>001</i>	<i>2</i>						
<i>FD-SB-C3 (WM C5-30)</i>	<i>S</i>	<i>3/23/18</i>	<i>14:30</i>	<i>5</i>	<i>20</i>	<i>C</i>	<i>SD</i>																<i>3</i>						
																							<i>4</i>						
																							<i>5</i>						
																							<i>6</i>						
																							<i>7</i>						
																							<i>8</i>						
																							<i>9</i>						
																							<i>10</i>						

Sampled By: *David Anderson* Sampler's Signature: *David Anderson* Phone #:

Receiving Comments:		Relinquished By/Affiliation		Date/Time		Accepted By/ Affiliation		Date/Time	
		<i>David Anderson / Pace</i>		<i>3/23/18 / 1600</i>		<i>Matt Pace</i>		<i>3/23/18 / 1600</i>	

T=5.4

Sample Condition Upon Receipt
Client Name: MPCA - FSD
Project #: _____
Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
Tracking Number: _____

WO#: 10424795
PM: SCU **Due Date: 04/06/18**
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____
Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No
Thermometer 151401163 **Used:** G87A9155100842 **Type of Ice:** Wet Blue None Dry Melted
Cooler Temp Read (°C): 5.2 **Cooler Temp Corrected (°C):** 5.4 **Biological Tissue Frozen?** Yes No N/A
 Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** 3-23-18 JDD
USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # Initial when completed: _____ Lot # of added preservative: _____
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ **Field Data Required?** Yes No
 Comments/Resolution: _____

Project Manager Review: Nathan Boberg **Date:** 3/26/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-B3-WM (5-26)		
Lab Sample ID	10424795001		
Filename	F180402B_15		
Injected By	SMT		
Total Amount Extracted	15.9 g	Matrix	Solid
% Moisture	36.8	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	03/23/2018 13:30
ICAL ID	F180329	Received	03/23/2018 16:00
CCal Filename(s)	F180402B_04 & F180402B_21	Extracted	03/27/2018 15:00
Method Blank ID	BLANK-61362	Analyzed	04/03/2018 00:37

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.1	----	1.0	2,3,7,8-TCDD-13C	2.00	66
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61362	Matrix	Solid
Filename	F180401B_07	Dilution	NA
Total Amount Extracted	75.0 g	Extracted	03/27/2018 15:00
ICAL ID	F180329	Analyzed	04/01/2018 16:13
CCal Filename(s)	F180401B_01 & F180401B_17	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	65
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	77

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Pace AnalyticalTM

Pace Analytical Services, LLC
 1700 Elm Street - Suite 200
 Minneapolis, MN 55414

Tel: 612-607-1700
 Fax: 612-607-6444

Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61363	Matrix	Solid
Filename	F180401B_02	Dilution	NA
Total Amount Extracted	75.3 g	Extracted	03/27/2018 15:00
ICAL ID	F180329	Analyzed	04/01/2018 12:29
CCal Filename(s)	F180401B_01 & F180401B_17	Injected By	BAL
Method Blank ID	BLANK-61362		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.20	102	2,3,7,8-TCDD-13C	2.0	64
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

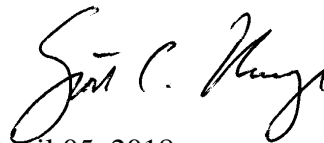
PaceProject#: 10424934
Sample Receipt Date: 03/27/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 05, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 5, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 45-68%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 91%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10424934

Appendix A

Sample Management

WO#: 10424934



10424934

Report No.....10424934_8290TCDD_DFR

Minnesota Pollution Control Agency		Chain-of-Custody Form		Work Order Number:		Turnaround Time:		COC ID:		LABORATORY		FOR LAB USE ONLY			
PROJECT/CLIENT INFO				LABORATORY				FOR LAB USE ONLY							
Facility Code:		MPCA - Freeway LF Solids		Program Code (MDH Lab Only):		Lab Name:		Address: 18-00383				Lab Work Order Sticker			
Project Name:		MPCA - Freeway LF Solids		Project Task Code:		Address: 18-00383		EPIC Profile #38716				Lab Work Order Sticker			
Project Manager:						Phone No:						Lab Work Order Sticker			
Potential Hazard?		If yes, add information to Sampler Comments Section										Lab Work Order Sticker			
SAMPLE DETAILS										ANALYSIS REQUESTED					
SAMPLE TYPE CODES			LAB MATRIX CODES			FIELD MATRIX CODES				ANALYSIS REQUESTED					
Sample=Routine Sample			DW=Drinking Water			Wt-Ground=Groundwater									
S-IVP=Integrated Vertical Profile Sample			NW=Non-potable Water			Wt-Surf=Surface Water									
S-CWOP=Composite Sample			SD=Soil/Solid			QC-BLANK=Artificial Blank Water									
QC-FB=Field Blank Sample			WP=Wipe			Leachate=Leachate Sample									
QC-FR=Field Replicate Sample			AR=Air												
QC-TB=Trip Blank Sample			BL=Biological Material												
			OT=Other												
			TS=Tissue												
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	Lab Sample No.	#
FD-SB-64 (3.5-17.0)	S	3/26/18	1150	15.5	17.0	C	SD				13	X	X		1
FD-SB-63 (4-16.0)	S	3/26/18	1400	4	16	C	SD				13	X	X	001	2
FD-SB-E3 (11-15.5)	S	3/26/18	1440	11	15	C	SD				13	X	X		3
FD-SB-F3 (3-11.0)	S	3/26/18	1530	3	11	C	SD				12	X	X		4
FD-SB-63 (7-16.0)	S	3/26/18	1635	7	16	C	SD				13	X	X	002	5
FD-SB-62 (10-16.0)	S	3/26/18	1720	10	16	C	SD				13	X	X	003	6
															7
															8
															9
															10
Sampled By: David Anderson				Sampler's Signature: David Anderson				Phone #:							
Receiving Comments:															
Relinquished By/Affiliation				Date/Time				Accepted By/Affiliation				Date/Time			
David Anderson / Pace Analytical				3/27/18/0700				W. Pace				3-27-18 815 4.7°C			

Page 5 of 13

Sample Condition Upon Receipt

Client Name: MPCA

Project #: **WO# : 10424934**

PM: SCU Due Date: 04/10/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 4.5 Cooler Temp Corrected (°C): 4.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 3/27/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No time on samples</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10424934

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-D3 (4-16wm)		
Lab Sample ID	10424934001		
Filename	F180403B_07		
Injected By	SMT		
Total Amount Extracted	14.1 g	Matrix	Solid
% Moisture	28.4	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	03/26/2018 14:00
ICAL ID	F180329	Received	03/27/2018 08:15
CCal Filename(s)	F180403B_01 & F180403B_18	Extracted	03/29/2018 15:05
Method Blank ID	BLANK-61419	Analyzed	04/03/2018 18:48

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	2.0	----	1.0	2,3,7,8-TCDD-13C	2.00	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	64

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-G3 (7-16wm)		
Lab Sample ID	10424934002		
Filename	F180403B_08		
Injected By	SMT		
Total Amount Extracted	14.6 g	Matrix	Solid
% Moisture	30.8	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	03/26/2018 16:35
ICAL ID	F180329	Received	03/27/2018 08:15
CCal Filename(s)	F180403B_01 & F180403B_18	Extracted	03/29/2018 15:05
Method Blank ID	BLANK-61419	Analyzed	04/03/2018 19:33

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	2.5	----	1.0	2,3,7,8-TCDD-13C	2.00	45
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	46

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-G2 (10-12wm)		
Lab Sample ID	10424934003		
Filename	F180403B_09		
Injected By	SMT		
Total Amount Extracted	14.4 g	Matrix	Solid
% Moisture	30.3	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	03/26/2018 17:20
ICAL ID	F180329	Received	03/27/2018 08:15
CCal Filename(s)	F180403B_01 & F180403B_18	Extracted	03/29/2018 15:05
Method Blank ID	BLANK-61419	Analyzed	04/03/2018 20:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	68
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	77

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61419	Matrix	Solid
Filename	U180403A_03	Dilution	NA
Total Amount Extracted	10.6 g	Extracted	03/29/2018 15:05
ICAL ID	U171222	Analyzed	04/03/2018 05:23
CCal Filename(s)	U180402B_14 & U180403A_18	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	63
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	82

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61420	Matrix	Solid
Filename	U180403A_01	Dilution	NA
Total Amount Extracted	10.8 g	Extracted	03/29/2018 15:05
ICAL ID	U171222	Analyzed	04/03/2018 03:58
CCal Filename(s)	U180402B_14 & U180403A_18	Injected By	BAL
Method Blank ID	BLANK-61419		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.18	91	2,3,7,8-TCDD-13C	2.0	70
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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June 20, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 27, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This project was revised on June 20, 2018 to add manganese results for all samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Ryan Thibault for
Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
California Certification #2973
Montana Certificate #CERT0103
California Certification #2973
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Minnesota Dept of Health Certification #: 1420586
Montana DHHS Certification #: CERT0102

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424937001	FD-SB-G4 (15.5-17.5)	Solid	03/26/18 11:30	03/27/18 08:15
10424937002	FD-SB-D3 (4-16wm)	Solid	03/26/18 14:00	03/27/18 08:15
10424937003	FD-SB-E3 (11-15.5)	Solid	03/26/18 14:40	03/27/18 08:15
10424937004	FD-SB-F3 (3-11wm)	Solid	03/26/18 15:30	03/27/18 08:15
10424937005	FD-SB-G3 (7-16wm)	Solid	03/26/18 16:35	03/27/18 08:15
10424937006	FD-SB-G2 (10-12wm)	Solid	03/26/18 17:20	03/27/18 08:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10424937001	FD-SB-G4 (15.5-17.5)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	PW1	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	JLR, JRH	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8270D	STB	12	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10424937002	FD-SB-D3 (4-16wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	PW1			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	JLR			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8270D	STB			12	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10424937003	FD-SB-E3 (11-15.5)			EPA 1630 (1998)	CPK	1	PASI-DUL

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JRH	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424937004	FD-SB-F3 (3-11wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JLR	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424937005	FD-SB-G3 (7-16wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JLR	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10424937006	FD-SB-G2 (10-12wm)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	PW1	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JRH	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) Lab ID: 10424937001 Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.2	1	03/30/18 11:35	04/02/18 17:26	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	309-00-2	
alpha-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	319-84-6	
beta-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	319-85-7	
delta-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	58-89-9	
Chlordane (Technical)	ND	ug/kg	45.7	2	03/28/18 12:51	04/05/18 20:59	57-74-9	
alpha-Chlordane	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	5103-71-9	
gamma-Chlordane	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	5103-74-2	
4,4'-DDD	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	72-54-8	
4,4'-DDE	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	72-55-9	
4,4'-DDT	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	50-29-3	
Dieldrin	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	60-57-1	
Endosulfan I	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	959-98-8	
Endosulfan II	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	33213-65-9	
Endosulfan sulfate	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	1031-07-8	
Endrin	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	72-20-8	
Endrin aldehyde	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	7421-93-4	
Endrin ketone	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 20:59	53494-70-5	
Heptachlor	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	76-44-8	
Heptachlor epoxide	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 20:59	1024-57-3	
Methoxychlor	ND	ug/kg	45.7	2	03/28/18 12:51	04/05/18 20:59	72-43-5	
Toxaphene	ND	ug/kg	137	2	03/28/18 12:51	04/05/18 20:59	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	77	%	30-150	2	03/28/18 12:51	04/05/18 20:59	877-09-8	5M, D3
Decachlorobiphenyl (S)	70	%	30-150	2	03/28/18 12:51	04/05/18 20:59	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11141-16-5	
PCB-1242 (Aroclor 1242)	124	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11097-69-1	
PCB-1260 (Aroclor 1260)	558	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	37324-23-5	
PCB-1268 (Aroclor 1268)	343	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	11100-14-4	
PCB, Total	1020	ug/kg	44.9	1	03/28/18 12:51	04/02/18 12:33	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	88	%	48-125	1	03/28/18 12:51	04/02/18 12:33	877-09-8	
Decachlorobiphenyl (S)	84	%	30-134	1	03/28/18 12:51	04/02/18 12:33	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	409	mg/kg	88.2	5	03/27/18 16:31	03/30/18 13:39		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) Lab ID: 10424937001 Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	87	%	50-150	5	03/27/18 16:31	03/30/18 13:39	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	31.0	mg/kg	24.2	1	04/03/18 09:56	04/04/18 12:19		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/03/18 09:56	04/04/18 12:19	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4370	mg/kg	13.0	1	03/28/18 04:51	04/02/18 12:51	7429-90-5	
Barium	104	mg/kg	0.65	1	03/28/18 04:51	04/02/18 12:51	7440-39-3	
Boron	124	mg/kg	9.8	1	03/28/18 04:51	04/02/18 12:51	7440-42-8	
Copper	38.1	mg/kg	0.65	1	03/28/18 04:51	04/02/18 12:51	7440-50-8	
Iron	10600	mg/kg	3.3	1	03/28/18 04:51	04/02/18 12:51	7439-89-6	
Manganese	834	mg/kg	1.6	5	03/28/18 04:51	06/19/18 08:54	7439-96-5	
Nickel	9.6	mg/kg	1.3	1	03/28/18 04:51	04/02/18 12:51	7440-02-0	
Silver	ND	mg/kg	0.65	1	03/28/18 04:51	04/02/18 12:51	7440-22-4	
Tin	ND	mg/kg	4.9	1	03/28/18 04:51	04/02/18 12:51	7440-31-5	
Titanium	206	mg/kg	1.6	1	03/28/18 04:51	04/02/18 12:51	7440-32-6	
Zinc	35.7	mg/kg	1.3	1	03/28/18 04:51	04/02/18 12:51	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	19.0	mg/kg	1.2	5	03/30/18 09:43	03/31/18 06:05	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7440-36-0	
Arsenic	1.4	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7440-38-2	
Beryllium	ND	mg/kg	0.27	20	03/28/18 04:52	03/30/18 17:17	7440-41-7	
Cadmium	0.14	mg/kg	0.11	20	03/28/18 04:52	03/30/18 17:17	7440-43-9	
Cobalt	3.2	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7440-48-4	
Lead	5.7	mg/kg	0.14	20	03/28/18 04:52	03/30/18 17:17	7439-92-1	
Lithium	1.9	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7439-93-2	
Selenium	ND	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7782-49-2	
Strontium	36.9	mg/kg	0.68	20	03/28/18 04:52	03/30/18 17:17	7440-24-6	
Vanadium	12.0	mg/kg	1.4	20	03/28/18 04:52	03/30/18 17:17	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.023	1	03/28/18 04:53	03/30/18 12:55	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	26.9	%	0.10	1		03/28/18 12:45		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	83-32-9	
Acenaphthylene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Anthracene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	120-12-7	
Benzo(a)anthracene	2900	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	56-55-3	
Benzo(a)pyrene	3550	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	50-32-8	
Benzo(b)fluoranthene	4160	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	205-99-2	
Benzo(g,h,i)perylene	2190	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	191-24-2	
Benzo(k)fluoranthene	2010	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	101-55-3	
Butylbenzylphthalate	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	85-68-7	
Carbazole	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	59-50-7	
4-Chloroaniline	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	108-60-1	
2-Chloronaphthalene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	91-58-7	
2-Chlorophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	7005-72-3	
Chrysene	3360	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	53-70-3	
Dibenzofuran	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	120-83-2	
Diethylphthalate	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	105-67-9	
Dimethylphthalate	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	131-11-3	
Di-n-butylphthalate	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2320	1	03/27/18 12:47	03/30/18 14:49	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	606-20-2	
Di-n-octylphthalate	576	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	122-66-7	
bis(2-Ethylhexyl)phthalate	45300	ug/kg	9010	20	03/27/18 12:47	03/30/18 19:53	117-81-7	
Fluoranthene	3560	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	206-44-0	
Fluorene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	87-68-3	
Hexachlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	118-74-1	
Hexachloroethane	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	67-72-1	
Indeno(1,2,3-cd)pyrene	1970	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	193-39-5	
Isophorone	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	78-59-1	
1-Methylnaphthalene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	90-12-0	
2-Methylnaphthalene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-G4 (15.5-17.5)** Lab ID: **10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	901	1	03/27/18 12:47	03/30/18 14:49		
Naphthalene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	91-20-3	
2-Nitroaniline	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	88-74-4	
3-Nitroaniline	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	99-09-2	
4-Nitroaniline	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	100-01-6	
Nitrobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	98-95-3	
2-Nitrophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	88-75-5	
4-Nitrophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	86-30-6	
Pentachlorophenol	ND	ug/kg	915	1	03/27/18 12:47	03/30/18 14:49	87-86-5	
Phenanthrene	1020	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	85-01-8	
Phenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	108-95-2	
Pyrene	3880	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	451	1	03/27/18 12:47	03/30/18 14:49	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	81	%.	43-125	1	03/27/18 12:47	03/30/18 14:49	4165-60-0	
2-Fluorobiphenyl (S)	90	%.	30-132	1	03/27/18 12:47	03/30/18 14:49	321-60-8	
p-Terphenyl-d14 (S)	91	%.	62-125	1	03/27/18 12:47	03/30/18 14:49	1718-51-0	
Phenol-d6 (S)	82	%.	48-125	1	03/27/18 12:47	03/30/18 14:49	13127-88-3	
2-Fluorophenol (S)	75	%.	40-125	1	03/27/18 12:47	03/30/18 14:49	367-12-4	
2,4,6-Tribromophenol (S)	86	%.	60-125	1	03/27/18 12:47	03/30/18 14:49	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	18.9	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	83-32-9	
Acenaphthylene	ND	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	208-96-8	
Anthracene	19.4	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	120-12-7	
Benzo(a)anthracene	197	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	56-55-3	
Benzo(a)pyrene	283	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	50-32-8	
Benzo(b)fluoranthene	335	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	205-99-2	
Benzo(g,h,i)perylene	197	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	191-24-2	
Benzo(k)fluoranthene	124	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	207-08-9	
Chrysene	241	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	218-01-9	
Dibenz(a,h)anthracene	41.3	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	53-70-3	
Fluoranthene	272	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	206-44-0	
Fluorene	ND	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	86-73-7	
Indeno(1,2,3-cd)pyrene	150	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	193-39-5	
Naphthalene	36.0	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	91-20-3	
Phenanthrene	72.3	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	85-01-8	
Pyrene	285	ug/kg	13.7	1	03/27/18 15:20	04/02/18 21:22	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	77	%.	42-125	1	03/27/18 15:20	04/02/18 21:22	321-60-8	
p-Terphenyl-d14 (S)	101	%.	57-125	1	03/27/18 15:20	04/02/18 21:22	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	25057-89-0	
2,4-D	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	94-75-7	
2,4-DB	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	94-82-6	
Dicamba	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	1918-00-9	
Dinoseb	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	88-85-7	
MCPA	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	94-74-6	
Pentachlorophenol	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	87-86-5	
Picloram	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	1918-02-1	
2,4,5-T	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	93-72-1	
Triclopyr	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 16:46	55335-06-3	
Surrogates								
2,4-DCAA (S)	56	%.	46-125	1	03/29/18 07:30	04/04/18 16:46	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2400	1	03/27/18 14:03	03/27/18 17:42	67-64-1	
Allyl chloride	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	107-05-1	
Benzene	ND	ug/kg	47.9	1	03/27/18 14:03	03/27/18 17:42	71-43-2	
Bromobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	108-86-1	
Bromochloromethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	74-97-5	
Bromodichloromethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	75-27-4	
Bromoform	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	75-25-2	
Bromomethane	ND	ug/kg	1200	1	03/27/18 14:03	03/27/18 17:42	74-83-9	
2-Butanone (MEK)	ND	ug/kg	599	1	03/27/18 14:03	03/27/18 17:42	78-93-3	
n-Butylbenzene	137	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	104-51-8	
sec-Butylbenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	135-98-8	
tert-Butylbenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	98-06-6	
Carbon tetrachloride	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	56-23-5	
Chlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	108-90-7	
Chloroethane	ND	ug/kg	1200	1	03/27/18 14:03	03/27/18 17:42	75-00-3	
Chloroform	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	67-66-3	
Chloromethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	74-87-3	
2-Chlorotoluene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	95-49-8	
4-Chlorotoluene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1200	1	03/27/18 14:03	03/27/18 17:42	96-12-8	
Dibromochloromethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	106-93-4	
Dibromomethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	75-71-8	
1,1-Dichloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	75-34-3	
1,2-Dichloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	107-06-2	
1,1-Dichloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,2-Dichloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1200	1	03/27/18 14:03	03/27/18 17:42	75-43-4	
1,2-Dichloropropane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	78-87-5	
1,3-Dichloropropane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	142-28-9	
2,2-Dichloropropane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	594-20-7	
1,1-Dichloropropene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	60-29-7	
Ethylbenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	599	1	03/27/18 14:03	03/27/18 17:42	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	98-82-8	
p-Isopropyltoluene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	99-87-6	
Methylene Chloride	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	599	1	03/27/18 14:03	03/27/18 17:42	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	1634-04-4	
Naphthalene	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	91-20-3	
n-Propylbenzene	190	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	103-65-1	
Styrene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	79-34-5	N2
Tetrachloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	127-18-4	
Tetrahydrofuran	ND	ug/kg	4790	1	03/27/18 14:03	03/27/18 17:42	109-99-9	
Toluene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	79-00-5	
Trichloroethene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	479	1	03/27/18 14:03	03/27/18 17:42	76-13-1	
1,2,4-Trimethylbenzene	302	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	120	1	03/27/18 14:03	03/27/18 17:42	108-67-8	
Vinyl chloride	ND	ug/kg	47.9	1	03/27/18 14:03	03/27/18 17:42	75-01-4	
Xylene (Total)	525	ug/kg	360	1	03/27/18 14:03	03/27/18 17:42	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%	75-125	1	03/27/18 14:03	03/27/18 17:42	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	03/27/18 14:03	03/27/18 17:42	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	03/27/18 14:03	03/27/18 17:42	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent ND mg/kg 273 100 04/02/18 15:00 04/04/18 12:50 18540-29-9 D3

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent **19.0** mg/kg 1.0 1 04/10/18 07:11 16065-83-1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G4 (15.5-17.5) **Lab ID: 10424937001** Collected: 03/26/18 11:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	0.90	mg/kg	0.49	1	03/29/18 10:55	03/29/18 13:16	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	0.98	1	03/30/18 14:00	04/02/18 21:55	16984-48-8	

Sample: FD-SB-D3 (4-16wm) **Lab ID: 10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.8	1	03/30/18 11:35	04/02/18 17:32	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	309-00-2	
alpha-BHC	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	319-84-6	
beta-BHC	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	319-85-7	
delta-BHC	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	58-89-9	
Chlordane (Technical)	ND	ug/kg	502	20	03/28/18 12:51	04/06/18 00:38	57-74-9	
alpha-Chlordane	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	5103-71-9	
gamma-Chlordane	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	5103-74-2	
4,4'-DDD	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	72-54-8	
4,4'-DDE	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	72-55-9	
4,4'-DDT	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	50-29-3	
Dieldrin	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	60-57-1	
Endosulfan I	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	959-98-8	
Endosulfan II	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	33213-65-9	
Endosulfan sulfate	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	1031-07-8	
Endrin	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	72-20-8	
Endrin aldehyde	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	7421-93-4	
Endrin ketone	ND	ug/kg	100	20	03/28/18 12:51	04/06/18 00:38	53494-70-5	
Heptachlor	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	76-44-8	
Heptachlor epoxide	ND	ug/kg	50.2	20	03/28/18 12:51	04/06/18 00:38	1024-57-3	
Methoxychlor	ND	ug/kg	502	20	03/28/18 12:51	04/06/18 00:38	72-43-5	
Toxaphene	ND	ug/kg	1500	20	03/28/18 12:51	04/06/18 00:38	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/28/18 12:51	04/06/18 00:38	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	03/28/18 12:51	04/06/18 00:38	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11141-16-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) Lab ID: 10424937002 Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1242 (Aroclor 1242)	1870	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	12672-29-6	
PCB-1254 (Aroclor 1254)	322	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	11100-14-4	
PCB, Total	2190	ug/kg	49.6	1	03/28/18 12:51	04/02/18 12:18	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	89	%.	48-125	1	03/28/18 12:51	04/02/18 12:18	877-09-8	
Decachlorobiphenyl (S)	82	%.	30-134	1	03/28/18 12:51	04/02/18 12:18	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3830	mg/kg	1430	1	03/27/18 16:31	03/30/18 14:07		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	1	03/27/18 16:31	03/30/18 14:07	638-68-6	S4
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	512	mg/kg	26.5	1	04/03/18 09:56	04/04/18 12:43		
Surrogates								
a,a,a-Trifluorotoluene (S)	94	%.	80-150	1	04/03/18 09:56	04/04/18 12:43	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	12800	mg/kg	14.9	1	03/28/18 04:51	04/02/18 12:59	7429-90-5	
Barium	167	mg/kg	0.75	1	03/28/18 04:51	04/02/18 12:59	7440-39-3	
Boron	12.7	mg/kg	11.2	1	03/28/18 04:51	04/02/18 12:59	7440-42-8	
Copper	36.4	mg/kg	0.75	1	03/28/18 04:51	04/02/18 12:59	7440-50-8	
Iron	23000	mg/kg	37.3	10	03/28/18 04:51	04/02/18 13:37	7439-89-6	
Manganese	353	mg/kg	0.37	1	03/28/18 04:51	04/02/18 12:59	7439-96-5	
Nickel	19.2	mg/kg	1.5	1	03/28/18 04:51	04/02/18 12:59	7440-02-0	
Silver	ND	mg/kg	0.75	1	03/28/18 04:51	04/02/18 12:59	7440-22-4	
Tin	9.9	mg/kg	5.6	1	03/28/18 04:51	04/02/18 12:59	7440-31-5	
Titanium	165	mg/kg	1.9	1	03/28/18 04:51	04/02/18 12:59	7440-32-6	
Zinc	63.6	mg/kg	1.5	1	03/28/18 04:51	04/02/18 12:59	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	26.8	mg/kg	1.3	5	03/30/18 09:43	03/31/18 06:18	7440-47-3	N2
6020A MET ICPMS								
Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7440-36-0	
Arsenic	3.3	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7440-38-2	
Beryllium	0.61	mg/kg	0.30	20	03/28/18 04:52	03/30/18 18:02	7440-41-7	
Cadmium	0.62	mg/kg	0.12	20	03/28/18 04:52	03/30/18 18:02	7440-43-9	
Cobalt	6.2	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7440-48-4	
Lead	49.8	mg/kg	0.15	20	03/28/18 04:52	03/30/18 18:02	7439-92-1	
Lithium	7.2	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7439-93-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) Lab ID: 10424937002 Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Selenium	1.1	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7782-49-2	
Strontium	42.5	mg/kg	0.75	20	03/28/18 04:52	03/30/18 18:02	7440-24-6	
Vanadium	28.5	mg/kg	1.5	20	03/28/18 04:52	03/30/18 18:02	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.089	mg/kg	0.030	1	03/28/18 04:53	03/30/18 12:58	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	33.6	%	0.10	1		03/28/18 12:45		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	83-32-9	
Acenaphthylene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	208-96-8	
Anthracene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	120-12-7	
Benzo(a)anthracene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	56-55-3	
Benzo(a)pyrene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	101-55-3	
Butylbenzylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	85-68-7	
Carbazole	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	59-50-7	
4-Chloroaniline	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	108-60-1	
2-Chloronaphthalene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	91-58-7	
2-Chlorophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	7005-72-3	
Chrysene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	53-70-3	
Dibenzofuran	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	120-83-2	
Diethylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	105-67-9	
Dimethylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	131-11-3	
Di-n-butylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2560	1	03/27/18 12:47	03/31/18 19:35	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	121-14-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-D3 (4-16wm)** Lab ID: **10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2,6-Dinitrotoluene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	606-20-2	
Di-n-octylphthalate	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	122-66-7	
bis(2-Ethylhexyl)phthalate	40000	ug/kg	4960	10	03/27/18 12:47	03/31/18 20:04	117-81-7	
Fluoranthene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	206-44-0	
Fluorene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	87-68-3	
Hexachlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	118-74-1	
Hexachloroethane	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	193-39-5	
Isophorone	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	78-59-1	
1-Methylnaphthalene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	90-12-0	
2-Methylnaphthalene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	992	1	03/27/18 12:47	03/31/18 19:35		
Naphthalene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	91-20-3	
2-Nitroaniline	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	88-74-4	
3-Nitroaniline	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	99-09-2	
4-Nitroaniline	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	100-01-6	
Nitrobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	98-95-3	
2-Nitrophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	88-75-5	
4-Nitrophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	86-30-6	
Pentachlorophenol	ND	ug/kg	1010	1	03/27/18 12:47	03/31/18 19:35	87-86-5	
Phenanthrene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	85-01-8	
Phenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	108-95-2	
Pyrene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	496	1	03/27/18 12:47	03/31/18 19:35	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	59	%	43-125	1	03/27/18 12:47	03/31/18 19:35	4165-60-0	
2-Fluorobiphenyl (S)	76	%	30-132	1	03/27/18 12:47	03/31/18 19:35	321-60-8	
p-Terphenyl-d14 (S)	75	%	62-125	1	03/27/18 12:47	03/31/18 19:35	1718-51-0	
Phenol-d6 (S)	68	%	48-125	1	03/27/18 12:47	03/31/18 19:35	13127-88-3	
2-Fluorophenol (S)	60	%	40-125	1	03/27/18 12:47	03/31/18 19:35	367-12-4	
2,4,6-Tribromophenol (S)	68	%	60-125	1	03/27/18 12:47	03/31/18 19:35	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	83-32-9	
Acenaphthylene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	208-96-8	
Anthracene	177	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	120-12-7	
Benzo(a)anthracene	204	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	56-55-3	
Benzo(a)pyrene	229	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	50-32-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) Lab ID: 10424937002 Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Benzo(b)fluoranthene	262	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	207-08-9	
Chrysene	331	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	53-70-3	
Fluoranthene	418	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	206-44-0	
Fluorene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	193-39-5	
Naphthalene	167	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	91-20-3	
Phenanthrene	380	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	85-01-8	
Pyrene	325	ug/kg	150	1	03/27/18 15:20	04/03/18 22:56	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	1	03/27/18 15:20	04/03/18 22:56	321-60-8	P3,S4
p-Terphenyl-d14 (S)	0	%.	57-125	1	03/27/18 15:20	04/03/18 22:56	1718-51-0	S4
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	25057-89-0	
2,4-D	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	94-75-7	
2,4-DB	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	94-82-6	
Dicamba	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	1918-00-9	
Dinoseb	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	88-85-7	
MCPA	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	94-74-6	
Pentachlorophenol	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	87-86-5	
Picloram	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	1918-02-1	
2,4,5-T	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	93-72-1	
Triclopyr	ND	mg/kg	0.49	5	03/29/18 07:30	04/04/18 18:44	55335-06-3	
Surrogates								
2,4-DCAA (S)	75	%.	46-125	5	03/29/18 07:30	04/04/18 18:44	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	2290	1	03/27/18 14:03	03/27/18 17:59	67-64-1	
Allyl chloride	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	107-05-1	
Benzene	199	ug/kg	45.8	1	03/27/18 14:03	03/27/18 17:59	71-43-2	
Bromobenzene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	108-86-1	
Bromochloromethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	74-97-5	
Bromodichloromethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	75-27-4	
Bromoform	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	75-25-2	
Bromomethane	ND	ug/kg	1150	1	03/27/18 14:03	03/27/18 17:59	74-83-9	
2-Butanone (MEK)	ND	ug/kg	573	1	03/27/18 14:03	03/27/18 17:59	78-93-3	
n-Butylbenzene	1360	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	104-51-8	
sec-Butylbenzene	1060	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	135-98-8	
tert-Butylbenzene	164	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	98-06-6	
Carbon tetrachloride	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	56-23-5	
Chlorobenzene	26400	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	108-90-7	
Chloroethane	ND	ug/kg	1150	1	03/27/18 14:03	03/27/18 17:59	75-00-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) Lab ID: 10424937002 Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Chloroform	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	67-66-3	
Chloromethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	74-87-3	
2-Chlorotoluene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	95-49-8	
4-Chlorotoluene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1150	1	03/27/18 14:03	03/27/18 17:59	96-12-8	
Dibromochloromethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	106-93-4	
Dibromomethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	74-95-3	
1,2-Dichlorobenzene	935	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	95-50-1	
1,3-Dichlorobenzene	2660	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	541-73-1	
1,4-Dichlorobenzene	17100	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	75-71-8	
1,1-Dichloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	75-34-3	
1,2-Dichloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	107-06-2	
1,1-Dichloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1150	1	03/27/18 14:03	03/27/18 17:59	75-43-4	
1,2-Dichloropropane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	78-87-5	
1,3-Dichloropropane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	142-28-9	
2,2-Dichloropropane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	594-20-7	
1,1-Dichloropropene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	60-29-7	
Ethylbenzene	1210	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	573	1	03/27/18 14:03	03/27/18 17:59	87-68-3	
Isopropylbenzene (Cumene)	684	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	98-82-8	
p-Isopropyltoluene	408	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	99-87-6	
Methylene Chloride	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	573	1	03/27/18 14:03	03/27/18 17:59	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	1634-04-4	
Naphthalene	1850	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	91-20-3	
n-Propylbenzene	1280	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	103-65-1	
Styrene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	79-34-5	N2
Tetrachloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	127-18-4	
Tetrahydrofuran	ND	ug/kg	4580	1	03/27/18 14:03	03/27/18 17:59	109-99-9	
Toluene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	87-61-6	
1,2,4-Trichlorobenzene	298	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	79-00-5	
Trichloroethene	ND	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	75-69-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-D3 (4-16wm) **Lab ID: 10424937002** Collected: 03/26/18 14:00 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,3-Trichloropropane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	458	1	03/27/18 14:03	03/27/18 17:59	76-13-1	
1,2,4-Trimethylbenzene	5000	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	95-63-6	
1,3,5-Trimethylbenzene	1570	ug/kg	115	1	03/27/18 14:03	03/27/18 17:59	108-67-8	
Vinyl chloride	ND	ug/kg	45.8	1	03/27/18 14:03	03/27/18 17:59	75-01-4	
Xylene (Total)	5190	ug/kg	344	1	03/27/18 14:03	03/27/18 17:59	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	75-125	1	03/27/18 14:03	03/27/18 17:59	17060-07-0	
Toluene-d8 (S)	102	%.	75-125	1	03/27/18 14:03	03/27/18 17:59	2037-26-5	
4-Bromofluorobenzene (S)	112	%.	75-125	1	03/27/18 14:03	03/27/18 17:59	460-00-4	

7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	30.2	10	04/02/18 15:00	04/04/18 13:17	18540-29-9	D3

Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	26.8	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	

9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.56	mg/kg	0.48	1	03/29/18 10:55	03/29/18 13:16	57-12-5	

9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	03/30/18 14:00	03/31/18 03:07	16984-48-8	

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	10.4	1	03/30/18 11:35	04/02/18 17:39	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	309-00-2	
alpha-BHC	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	319-84-6	
beta-BHC	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	319-85-7	
delta-BHC	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	58-89-9	
Chlordane (Technical)	ND	ug/kg	24.4	1	03/28/18 12:51	04/05/18 20:22	57-74-9	
alpha-Chlordane	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	5103-74-2	
4,4'-DDD	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	72-54-8	
4,4'-DDE	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	72-55-9	
4,4'-DDT	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	50-29-3	
Dieldrin	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	60-57-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Endosulfan I	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	959-98-8	
Endosulfan II	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	33213-65-9	
Endosulfan sulfate	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	1031-07-8	
Endrin	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	72-20-8	
Endrin aldehyde	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	7421-93-4	
Endrin ketone	ND	ug/kg	4.9	1	03/28/18 12:51	04/05/18 20:22	53494-70-5	
Heptachlor	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.4	1	03/28/18 12:51	04/05/18 20:22	1024-57-3	
Methoxychlor	ND	ug/kg	24.4	1	03/28/18 12:51	04/05/18 20:22	72-43-5	
Toxaphene	ND	ug/kg	72.9	1	03/28/18 12:51	04/05/18 20:22	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	53	%	30-150	1	03/28/18 12:51	04/05/18 20:22	877-09-8	
Decachlorobiphenyl (S)	79	%	30-150	1	03/28/18 12:51	04/05/18 20:22	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	11100-14-4	
PCB, Total	ND	ug/kg	48.3	1	03/28/18 12:51	04/02/18 14:56	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	03/28/18 12:51	04/02/18 14:56	877-09-8	
Decachlorobiphenyl (S)	83	%	30-134	1	03/28/18 12:51	04/02/18 14:56	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	11.6	1	03/27/18 16:31	03/30/18 14:57		
Surrogates								
n-Triacontane (S)	63	%	50-150	1	03/27/18 16:31	03/30/18 14:57	638-68-6	
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.2	1	04/03/18 09:56	04/04/18 11:54		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/03/18 09:56	04/04/18 11:54	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	12900	mg/kg	14.3	1	03/28/18 04:51	04/02/18 13:02	7429-90-5	
Barium	104	mg/kg	0.71	1	03/28/18 04:51	04/02/18 13:02	7440-39-3	
Boron	188	mg/kg	10.7	1	03/28/18 04:51	04/02/18 13:02	7440-42-8	
Copper	25.2	mg/kg	0.71	1	03/28/18 04:51	04/02/18 13:02	7440-50-8	
Iron	36000	mg/kg	35.6	10	03/28/18 04:51	04/02/18 13:40	7439-89-6	
Manganese	146	mg/kg	0.36	1	03/28/18 04:51	04/02/18 13:02	7439-96-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Nickel	26.8	mg/kg	1.4	1	03/28/18 04:51	04/02/18 13:02	7440-02-0	
Silver	ND	mg/kg	0.71	1	03/28/18 04:51	04/02/18 13:02	7440-22-4	
Tin	ND	mg/kg	5.3	1	03/28/18 04:51	04/02/18 13:02	7440-31-5	
Titanium	589	mg/kg	1.8	1	03/28/18 04:51	04/02/18 13:02	7440-32-6	
Zinc	149	mg/kg	1.4	1	03/28/18 04:51	04/02/18 13:02	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	45.1	mg/kg	1.4	5	03/30/18 09:43	03/31/18 06:23	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7440-36-0	
Arsenic	16.9	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7440-38-2	
Beryllium	2.9	mg/kg	0.29	20	03/28/18 04:52	03/30/18 18:06	7440-41-7	
Cadmium	1.8	mg/kg	0.12	20	03/28/18 04:52	03/30/18 18:06	7440-43-9	
Cobalt	7.9	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7440-48-4	
Lead	20.5	mg/kg	0.15	20	03/28/18 04:52	03/30/18 18:06	7439-92-1	
Lithium	10.4	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7439-93-2	
Selenium	5.6	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7782-49-2	
Strontium	69.7	mg/kg	0.73	20	03/28/18 04:52	03/30/18 18:06	7440-24-6	
Vanadium	86.8	mg/kg	1.5	20	03/28/18 04:52	03/30/18 18:06	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.075	mg/kg	0.027	1	03/28/18 04:53	03/30/18 13:00	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	31.9	%	0.10	1		03/28/18 12:46		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	83-32-9	
Acenaphthylene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	208-96-8	
Anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	120-12-7	
Benzo(a)anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	56-55-3	
Benzo(a)pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	101-55-3	
Butylbenzylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	85-68-7	
Carbazole	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	59-50-7	
4-Chloroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	108-60-1	
2-Chloronaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	91-58-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
2-Chlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	7005-72-3	
Chrysene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	53-70-3	
Dibenzofuran	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	120-83-2	
Diethylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	105-67-9	
Dimethylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	131-11-3	
Di-n-butylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2490	1	03/27/18 12:47	03/30/18 12:48	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	606-20-2	
Di-n-octylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	117-81-7	
Fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	206-44-0	
Fluorene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	87-68-3	
Hexachlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	118-74-1	
Hexachloroethane	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	193-39-5	
Isophorone	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	78-59-1	
1-Methylnaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	90-12-0	
2-Methylnaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	968	1	03/27/18 12:47	03/30/18 12:48		
Naphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	91-20-3	
2-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	88-74-4	
3-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	99-09-2	
4-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	100-01-6	
Nitrobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	98-95-3	
2-Nitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	88-75-5	
4-Nitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	86-30-6	
Pentachlorophenol	ND	ug/kg	983	1	03/27/18 12:47	03/30/18 12:48	87-86-5	
Phenanthrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	85-01-8	
Phenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	108-95-2	
Pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
1,2,4-Trichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 12:48	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%.	43-125	1	03/27/18 12:47	03/30/18 12:48	4165-60-0	
2-Fluorobiphenyl (S)	79	%.	30-132	1	03/27/18 12:47	03/30/18 12:48	321-60-8	
p-Terphenyl-d14 (S)	94	%.	62-125	1	03/27/18 12:47	03/30/18 12:48	1718-51-0	
Phenol-d6 (S)	79	%.	48-125	1	03/27/18 12:47	03/30/18 12:48	13127-88-3	
2-Fluorophenol (S)	79	%.	40-125	1	03/27/18 12:47	03/30/18 12:48	367-12-4	
2,4,6-Tribromophenol (S)	86	%.	60-125	1	03/27/18 12:47	03/30/18 12:48	118-79-6	
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	83-32-9	
Acenaphthylene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	208-96-8	
Anthracene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	120-12-7	
Benzo(a)anthracene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	207-08-9	
Chrysene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	53-70-3	
Fluoranthene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	206-44-0	
Fluorene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	193-39-5	
Naphthalene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	91-20-3	
Phenanthrene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	85-01-8	
Pyrene	ND	ug/kg	14.7	1	03/27/18 15:20	04/02/18 21:43	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	73	%.	42-125	1	03/27/18 15:20	04/02/18 21:43	321-60-8	
p-Terphenyl-d14 (S)	90	%.	57-125	1	03/27/18 15:20	04/02/18 21:43	1718-51-0	
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	25057-89-0	
2,4-D	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	94-75-7	
2,4-DB	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	94-82-6	
Dicamba	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	1918-00-9	
Dinoseb	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	88-85-7	
MCPA	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	94-74-6	
Pentachlorophenol	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	87-86-5	
Picloram	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	1918-02-1	
2,4,5-T	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	93-72-1	
Triclopyr	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:01	55335-06-3	
Surrogates								
2,4-DCAA (S)	67	%.	46-125	1	03/29/18 07:30	04/04/18 17:01	19719-28-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1580	1	03/27/18 14:03	03/27/18 18:15	67-64-1	
Allyl chloride	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	107-05-1	
Benzene	ND	ug/kg	31.6	1	03/27/18 14:03	03/27/18 18:15	71-43-2	
Bromobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	108-86-1	
Bromochloromethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	74-97-5	
Bromodichloromethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	75-27-4	
Bromoform	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	75-25-2	
Bromomethane	ND	ug/kg	790	1	03/27/18 14:03	03/27/18 18:15	74-83-9	
2-Butanone (MEK)	ND	ug/kg	395	1	03/27/18 14:03	03/27/18 18:15	78-93-3	
n-Butylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	98-06-6	
Carbon tetrachloride	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	56-23-5	
Chlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	108-90-7	
Chloroethane	ND	ug/kg	790	1	03/27/18 14:03	03/27/18 18:15	75-00-3	
Chloroform	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	67-66-3	
Chloromethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	790	1	03/27/18 14:03	03/27/18 18:15	96-12-8	
Dibromochloromethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	106-93-4	
Dibromomethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	75-71-8	
1,1-Dichloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	107-06-2	
1,1-Dichloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	156-60-5	
Dichlorofluoromethane	ND	ug/kg	790	1	03/27/18 14:03	03/27/18 18:15	75-43-4	
1,2-Dichloropropane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	60-29-7	
Ethylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	395	1	03/27/18 14:03	03/27/18 18:15	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	98-82-8	
p-Isopropyltoluene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	99-87-6	
Methylene Chloride	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	395	1	03/27/18 14:03	03/27/18 18:15	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-E3 (11-15.5) **Lab ID: 10424937003** Collected: 03/26/18 14:40 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	1634-04-4	
Naphthalene	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	91-20-3	
n-Propylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	103-65-1	
Styrene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	79-34-5	N2
Tetrachloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	127-18-4	
Tetrahydrofuran	ND	ug/kg	3160	1	03/27/18 14:03	03/27/18 18:15	109-99-9	
Toluene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	79-00-5	
Trichloroethene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	316	1	03/27/18 14:03	03/27/18 18:15	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	79.0	1	03/27/18 14:03	03/27/18 18:15	108-67-8	
Vinyl chloride	ND	ug/kg	31.6	1	03/27/18 14:03	03/27/18 18:15	75-01-4	
Xylene (Total)	ND	ug/kg	237	1	03/27/18 14:03	03/27/18 18:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%.	75-125	1	03/27/18 14:03	03/27/18 18:15	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/27/18 14:03	03/27/18 18:15	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1	03/27/18 14:03	03/27/18 18:15	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.7	5	04/02/18 15:00	04/04/18 13:18	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	45.1	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.59	1	03/29/18 10:55	03/29/18 13:17	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	3.5	mg/kg	0.99	1	03/30/18 14:00	03/31/18 05:04	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-F3 (3-11wm)** Lab ID: **10424937004** Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.70	1	03/30/18 11:35	04/02/18 17:46	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	309-00-2	
alpha-BHC	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	319-84-6	
beta-BHC	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	319-85-7	
delta-BHC	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	58-89-9	
Chlordane (Technical)	ND	ug/kg	438	20	03/28/18 12:51	04/06/18 00:56	57-74-9	
alpha-Chlordane	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	5103-71-9	
gamma-Chlordane	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	5103-74-2	
4,4'-DDD	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	72-54-8	
4,4'-DDE	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	72-55-9	
4,4'-DDT	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	50-29-3	
Dieldrin	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	60-57-1	
Endosulfan I	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	959-98-8	
Endosulfan II	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	33213-65-9	
Endosulfan sulfate	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	1031-07-8	
Endrin	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	72-20-8	
Endrin aldehyde	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	7421-93-4	
Endrin ketone	ND	ug/kg	87.4	20	03/28/18 12:51	04/06/18 00:56	53494-70-5	
Heptachlor	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	76-44-8	
Heptachlor epoxide	ND	ug/kg	43.8	20	03/28/18 12:51	04/06/18 00:56	1024-57-3	
Methoxychlor	ND	ug/kg	438	20	03/28/18 12:51	04/06/18 00:56	72-43-5	
Toxaphene	ND	ug/kg	1310	20	03/28/18 12:51	04/06/18 00:56	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	03/28/18 12:51	04/06/18 00:56	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	03/28/18 12:51	04/06/18 00:56	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	53469-21-9	
PCB-1248 (Aroclor 1248)	928	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	12672-29-6	
PCB-1254 (Aroclor 1254)	1280	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	11100-14-4	
PCB, Total	2200	ug/kg	43.3	1	03/28/18 12:51	04/02/18 14:40	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	03/28/18 12:51	04/02/18 14:40	877-09-8	
Decachlorobiphenyl (S)	77	%	30-134	1	03/28/18 12:51	04/02/18 14:40	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) Lab ID: 10424937004 Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	229	mg/kg	55.1	5	03/27/18 16:31	03/30/18 13:46		T6
Surrogates								
n-Triacontane (S)	43	%	50-150	5	03/27/18 16:31	03/30/18 13:46	638-68-6	S5
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	734	mg/kg	43.9	1	04/03/18 09:56	04/04/18 13:07		
Surrogates								
a,a,a-Trifluorotoluene (S)	96	%	80-150	1	04/03/18 09:56	04/04/18 13:07	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8730	mg/kg	12.4	1	03/28/18 04:51	04/02/18 13:05	7429-90-5	
Barium	489	mg/kg	0.62	1	03/28/18 04:51	04/02/18 13:05	7440-39-3	
Boron	163	mg/kg	9.3	1	03/28/18 04:51	04/02/18 13:05	7440-42-8	
Copper	47.2	mg/kg	0.62	1	03/28/18 04:51	04/02/18 13:05	7440-50-8	
Iron	43500	mg/kg	31.1	10	03/28/18 04:51	04/02/18 13:43	7439-89-6	
Manganese	230	mg/kg	0.31	1	03/28/18 04:51	04/02/18 13:05	7439-96-5	
Nickel	33.7	mg/kg	1.2	1	03/28/18 04:51	04/02/18 13:05	7440-02-0	
Silver	ND	mg/kg	0.62	1	03/28/18 04:51	04/02/18 13:05	7440-22-4	
Tin	102	mg/kg	4.7	1	03/28/18 04:51	04/02/18 13:05	7440-31-5	
Titanium	340	mg/kg	1.6	1	03/28/18 04:51	04/02/18 13:05	7440-32-6	
Zinc	312	mg/kg	1.2	1	03/28/18 04:51	04/02/18 13:05	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	45.0	mg/kg	1.3	5	03/30/18 09:43	03/31/18 06:28	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	2.5	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7440-36-0	
Arsenic	20.6	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7440-38-2	
Beryllium	1.9	mg/kg	0.26	20	03/28/18 04:52	03/30/18 18:11	7440-41-7	
Cadmium	3.4	mg/kg	0.10	20	03/28/18 04:52	03/30/18 18:11	7440-43-9	
Cobalt	8.3	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7440-48-4	
Lead	352	mg/kg	0.13	20	03/28/18 04:52	03/30/18 18:11	7439-92-1	
Lithium	7.6	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7439-93-2	
Selenium	4.2	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7782-49-2	
Strontium	72.9	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:11	7440-24-6	
Vanadium	76.5	mg/kg	1.3	20	03/28/18 04:52	03/30/18 18:11	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.40	mg/kg	0.023	1	03/28/18 04:53	03/30/18 13:02	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	24.1	%	0.10	1		03/28/18 12:46		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) Lab ID: 10424937004 Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	208-96-8	
Anthracene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	120-12-7	
Benzo(a)anthracene	3470	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	56-55-3	
Benzo(a)pyrene	2690	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	50-32-8	
Benzo(b)fluoranthene	3300	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	85-68-7	
Carbazole	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	59-50-7	
4-Chloroaniline	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	91-58-7	
2-Chlorophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	7005-72-3	
Chrysene	3150	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	53-70-3	
Dibenzofuran	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	120-83-2	
Diethylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	105-67-9	
Dimethylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	11200	5	03/27/18 12:47	03/30/18 21:24	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	117-81-7	
Fluoranthene	7320	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	206-44-0	
Fluorene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	87-68-3	
Hexachlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	118-74-1	
Hexachloroethane	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	193-39-5	
Isophorone	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) Lab ID: 10424937004 Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	4340	5	03/27/18 12:47	03/30/18 21:24		
Naphthalene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	91-20-3	
2-Nitroaniline	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	88-74-4	
3-Nitroaniline	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	99-09-2	
4-Nitroaniline	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	100-01-6	
Nitrobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	98-95-3	
2-Nitrophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	88-75-5	
4-Nitrophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	86-30-6	
Pentachlorophenol	ND	ug/kg	4400	5	03/27/18 12:47	03/30/18 21:24	87-86-5	
Phenanthrene	8430	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	85-01-8	
Phenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	108-95-2	
Pyrene	6380	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2170	5	03/27/18 12:47	03/30/18 21:24	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	67	%	43-125	5	03/27/18 12:47	03/30/18 21:24	4165-60-0	D4
2-Fluorobiphenyl (S)	80	%	30-132	5	03/27/18 12:47	03/30/18 21:24	321-60-8	
p-Terphenyl-d14 (S)	81	%	62-125	5	03/27/18 12:47	03/30/18 21:24	1718-51-0	
Phenol-d6 (S)	75	%	48-125	5	03/27/18 12:47	03/30/18 21:24	13127-88-3	
2-Fluorophenol (S)	66	%	40-125	5	03/27/18 12:47	03/30/18 21:24	367-12-4	
2,4,6-Tribromophenol (S)	74	%	60-125	5	03/27/18 12:47	03/30/18 21:24	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	243	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	83-32-9	
Acenaphthylene	ND	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	208-96-8	
Anthracene	541	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	120-12-7	
Benzo(a)anthracene	936	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	56-55-3	
Benzo(a)pyrene	937	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	50-32-8	
Benzo(b)fluoranthene	1120	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	205-99-2	
Benzo(g,h,i)perylene	434	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	191-24-2	
Benzo(k)fluoranthene	1040	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	207-08-9	
Chrysene	1040	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	218-01-9	
Dibenz(a,h)anthracene	145	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	53-70-3	
Fluoranthene	1770	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	206-44-0	
Fluorene	328	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	86-73-7	
Indeno(1,2,3-cd)pyrene	389	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	193-39-5	
Naphthalene	232	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	91-20-3	
Phenanthrene	1540	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	85-01-8	
Pyrene	1310	ug/kg	65.7	5	03/27/18 15:20	04/03/18 23:20	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	82	%	42-125	5	03/27/18 15:20	04/03/18 23:20	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-F3 (3-11wm)** Lab ID: **10424937004** Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
p-Terphenyl-d14 (S)	84	%	57-125	5	03/27/18 15:20	04/03/18 23:20	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	25057-89-0	
2,4-D	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	94-75-7	
2,4-DB	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	94-82-6	
Dicamba	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	1918-00-9	
Dinoseb	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	88-85-7	
MCPA	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	94-74-6	
Pentachlorophenol	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	87-86-5	
Picloram	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	1918-02-1	
2,4,5-T	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	93-72-1	
Triclopyr	ND	mg/kg	0.22	5	03/29/18 07:30	04/04/18 19:58	55335-06-3	
Surrogates								
2,4-DCAA (S)	61	%	46-125	5	03/29/18 07:30	04/04/18 19:58	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	4330	1	03/27/18 14:03	03/27/18 19:06	67-64-1	
Allyl chloride	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	107-05-1	
Benzene	142	ug/kg	86.6	1	03/27/18 14:03	03/27/18 19:06	71-43-2	
Bromobenzene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	108-86-1	
Bromochloromethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	74-97-5	
Bromodichloromethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	75-27-4	
Bromoform	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	75-25-2	
Bromomethane	ND	ug/kg	2170	1	03/27/18 14:03	03/27/18 19:06	74-83-9	
2-Butanone (MEK)	ND	ug/kg	1080	1	03/27/18 14:03	03/27/18 19:06	78-93-3	
n-Butylbenzene	3350	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	104-51-8	
sec-Butylbenzene	4440	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	135-98-8	
tert-Butylbenzene	412	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	98-06-6	
Carbon tetrachloride	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	56-23-5	
Chlorobenzene	487	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	108-90-7	
Chloroethane	ND	ug/kg	2170	1	03/27/18 14:03	03/27/18 19:06	75-00-3	
Chloroform	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	67-66-3	
Chloromethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	74-87-3	
2-Chlorotoluene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	95-49-8	
4-Chlorotoluene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	2170	1	03/27/18 14:03	03/27/18 19:06	96-12-8	
Dibromochloromethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	106-93-4	
Dibromomethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	74-95-3	
1,2-Dichlorobenzene	79700	ug/kg	433	2	03/27/18 14:03	03/28/18 19:41	95-50-1	
1,3-Dichlorobenzene	974	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	541-73-1	
1,4-Dichlorobenzene	32700	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	75-71-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) **Lab ID: 10424937004** Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1-Dichloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	75-34-3	
1,2-Dichloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	107-06-2	
1,1-Dichloroethene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	156-60-5	
Dichlorofluoromethane	ND	ug/kg	2170	1	03/27/18 14:03	03/27/18 19:06	75-43-4	
1,2-Dichloropropane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	78-87-5	
1,3-Dichloropropane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	142-28-9	
2,2-Dichloropropane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	594-20-7	
1,1-Dichloropropene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	60-29-7	
Ethylbenzene	12200	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	1080	1	03/27/18 14:03	03/27/18 19:06	87-68-3	
Isopropylbenzene (Cumene)	2390	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	98-82-8	
p-Isopropyltoluene	13000	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	99-87-6	
Methylene Chloride	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	1080	1	03/27/18 14:03	03/27/18 19:06	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	1634-04-4	
Naphthalene	41000	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	91-20-3	
n-Propylbenzene	3550	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	103-65-1	
Styrene	903	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	79-34-5	N2
Tetrachloroethene	5880	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	127-18-4	
Tetrahydrofuran	ND	ug/kg	8660	1	03/27/18 14:03	03/27/18 19:06	109-99-9	
Toluene	744	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	108-88-3	
1,2,3-Trichlorobenzene	725	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	87-61-6	
1,2,4-Trichlorobenzene	4380	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	79-00-5	
Trichloroethene	ND	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	866	1	03/27/18 14:03	03/27/18 19:06	76-13-1	
1,2,4-Trimethylbenzene	17000	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	95-63-6	
1,3,5-Trimethylbenzene	5920	ug/kg	217	1	03/27/18 14:03	03/27/18 19:06	108-67-8	
Vinyl chloride	ND	ug/kg	86.6	1	03/27/18 14:03	03/27/18 19:06	75-01-4	
Xylene (Total)	13700	ug/kg	650	1	03/27/18 14:03	03/27/18 19:06	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	75-125	1	03/27/18 14:03	03/27/18 19:06	17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1	03/27/18 14:03	03/27/18 19:06	2037-26-5	
4-Bromofluorobenzene (S)	115	%.	75-125	1	03/27/18 14:03	03/27/18 19:06	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-F3 (3-11wm) Lab ID: 10424937004 Collected: 03/26/18 15:30 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	13.0	5	04/02/18 15:00	04/04/18 13:18	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	45.0	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	0.58	mg/kg	0.36	1	03/29/18 10:55	03/29/18 13:18	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	1.0	1	03/30/18 14:00	03/31/18 02:08	16984-48-8	

Sample: FD-SB-G3 (7-16wm) Lab ID: 10424937005 Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	8.04	1	03/30/18 11:35	04/02/18 17:52	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	309-00-2	
alpha-BHC	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	319-84-6	
beta-BHC	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	319-85-7	
delta-BHC	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	58-89-9	
Chlordane (Technical)	ND	ug/kg	2170	100	03/28/18 12:51	04/05/18 23:07	57-74-9	
alpha-Chlordane	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	5103-71-9	
gamma-Chlordane	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	5103-74-2	
4,4'-DDD	511	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	72-54-8	
4,4'-DDE	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	72-55-9	
4,4'-DDT	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	50-29-3	
Dieldrin	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	60-57-1	
Endosulfan I	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	959-98-8	
Endosulfan II	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	33213-65-9	
Endosulfan sulfate	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	1031-07-8	
Endrin	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	72-20-8	
Endrin aldehyde	ND	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	7421-93-4	
Endrin ketone	701	ug/kg	432	100	03/28/18 12:51	04/05/18 23:07	53494-70-5	
Heptachlor	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	76-44-8	
Heptachlor epoxide	ND	ug/kg	217	100	03/28/18 12:51	04/05/18 23:07	1024-57-3	
Methoxychlor	ND	ug/kg	2170	100	03/28/18 12:51	04/05/18 23:07	72-43-5	
Toxaphene	ND	ug/kg	6490	100	03/28/18 12:51	04/05/18 23:07	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	100	03/28/18 12:51	04/05/18 23:07	877-09-8	3M, D4, S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) Lab ID: 10424937005 Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	0	%.	30-150	100	03/28/18 12:51	04/05/18 23:07	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11141-16-5	
PCB-1242 (Aroclor 1242)	1110	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11097-69-1	
PCB-1260 (Aroclor 1260)	639	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	11100-14-4	
PCB, Total	1750	ug/kg	42.9	1	03/28/18 12:51	04/02/18 14:08	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	73	%.	48-125	1	03/28/18 12:51	04/02/18 14:08	877-09-8	
Decachlorobiphenyl (S)	72	%.	30-134	1	03/28/18 12:51	04/02/18 14:08	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	83.8	mg/kg	57.6	5	03/27/18 16:31	03/30/18 13:53		T6
Surrogates								
n-Triacontane (S)	71	%.	50-150	5	03/27/18 16:31	03/30/18 13:53	638-68-6	
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	24.0	1	04/03/18 09:56	04/05/18 17:32		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/03/18 09:56	04/05/18 17:32	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10600	mg/kg	12.9	1	03/28/18 04:51	04/02/18 13:08	7429-90-5	
Barium	179	mg/kg	0.64	1	03/28/18 04:51	04/02/18 13:08	7440-39-3	
Boron	163	mg/kg	9.7	1	03/28/18 04:51	04/02/18 13:08	7440-42-8	
Copper	66.2	mg/kg	0.64	1	03/28/18 04:51	04/02/18 13:08	7440-50-8	
Iron	42300	mg/kg	32.2	10	03/28/18 04:51	04/02/18 13:53	7439-89-6	
Manganese	225	mg/kg	0.32	1	03/28/18 04:51	04/02/18 13:08	7439-96-5	
Nickel	24.4	mg/kg	1.3	1	03/28/18 04:51	04/02/18 13:08	7440-02-0	
Silver	0.66	mg/kg	0.64	1	03/28/18 04:51	04/02/18 13:08	7440-22-4	
Tin	89.2	mg/kg	4.8	1	03/28/18 04:51	04/02/18 13:08	7440-31-5	
Titanium	408	mg/kg	1.6	1	03/28/18 04:51	04/02/18 13:08	7440-32-6	
Zinc	1540	mg/kg	1.3	1	03/28/18 04:51	04/02/18 13:08	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	40.2	mg/kg	1.2	5	03/30/18 09:43	03/31/18 06:32	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) Lab ID: 10424937005 Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	2.1	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7440-36-0	
Arsenic	13.8	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7440-38-2	
Beryllium	1.2	mg/kg	0.26	20	03/28/18 04:52	03/30/18 18:16	7440-41-7	
Cadmium	4.8	mg/kg	0.10	20	03/28/18 04:52	03/30/18 18:16	7440-43-9	
Cobalt	6.7	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7440-48-4	
Lead	311	mg/kg	0.13	20	03/28/18 04:52	03/30/18 18:16	7439-92-1	
Lithium	7.0	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7439-93-2	
Selenium	3.5	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7782-49-2	
Strontium	73.5	mg/kg	0.65	20	03/28/18 04:52	03/30/18 18:16	7440-24-6	
Vanadium	54.0	mg/kg	1.3	20	03/28/18 04:52	03/30/18 18:16	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.27	mg/kg	0.024	1	03/28/18 04:53	03/30/18 13:04	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	23.1	%	0.10	1		03/28/18 12:46		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	72100	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	83-32-9	
Acenaphthylene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	208-96-8	
Anthracene	173000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	120-12-7	
Benzo(a)anthracene	162000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	56-55-3	
Benzo(a)pyrene	117000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	50-32-8	
Benzo(b)fluoranthene	145000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	205-99-2	
Benzo(g,h,i)perylene	61700	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	191-24-2	
Benzo(k)fluoranthene	64300	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	101-55-3	
Butylbenzylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	85-68-7	
Carbazole	74600	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	59-50-7	
4-Chloroaniline	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	108-60-1	
2-Chloronaphthalene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	91-58-7	
2-Chlorophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	7005-72-3	
Chrysene	154000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	53-70-3	
Dibenzofuran	65300	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: **FD-SB-G3 (7-16wm)** Lab ID: **10424937005** Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Diethylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	105-67-9	
Dimethylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	131-11-3	
Di-n-butylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	110000	10	03/27/18 12:47	03/31/18 20:34	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	606-20-2	
Di-n-octylphthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	117-81-7	
Fluoranthene	394000	ug/kg	107000	50	03/27/18 12:47	03/31/18 21:03	206-44-0	
Fluorene	104000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	87-68-3	
Hexachlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	118-74-1	
Hexachloroethane	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	67-72-1	
Indeno(1,2,3-cd)pyrene	56300	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	193-39-5	
Isophorone	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	78-59-1	
1-Methylnaphthalene	30000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	90-12-0	
2-Methylnaphthalene	47600	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	42700	10	03/27/18 12:47	03/31/18 20:34		
Naphthalene	66500	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	91-20-3	
2-Nitroaniline	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	88-74-4	
3-Nitroaniline	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	99-09-2	
4-Nitroaniline	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	100-01-6	
Nitrobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	98-95-3	
2-Nitrophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	88-75-5	
4-Nitrophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	86-30-6	
Pentachlorophenol	ND	ug/kg	43400	10	03/27/18 12:47	03/31/18 20:34	87-86-5	
Phenanthrene	545000	ug/kg	107000	50	03/27/18 12:47	03/31/18 21:03	85-01-8	
Phenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	108-95-2	
Pyrene	327000	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	21400	10	03/27/18 12:47	03/31/18 20:34	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	10	03/27/18 12:47	03/31/18 20:34	4165-60-0	D3,P3, S4
2-Fluorobiphenyl (S)	0	%	30-132	10	03/27/18 12:47	03/31/18 20:34	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	10	03/27/18 12:47	03/31/18 20:34	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	10	03/27/18 12:47	03/31/18 20:34	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	10	03/27/18 12:47	03/31/18 20:34	367-12-4	S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) **Lab ID: 10424937005** Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Surrogates								
2,4,6-Tribromophenol (S)	0	%	60-125	10	03/27/18 12:47	03/31/18 20:34	118-79-6	S4
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	45000	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	83-32-9	
Acenaphthylene	ND	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	208-96-8	
Anthracene	105000	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	120-12-7	
Benzo(a)anthracene	99600	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	56-55-3	
Benzo(a)pyrene	73000	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	50-32-8	
Benzo(b)fluoranthene	85300	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	205-99-2	
Benzo(g,h,i)perylene	38500	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	191-24-2	
Benzo(k)fluoranthene	37900	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	207-08-9	
Chrysene	83700	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	218-01-9	
Dibenz(a,h)anthracene	11700	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	53-70-3	
Fluoranthene	243000	ug/kg	16200	250	03/27/18 15:20	04/04/18 12:05	206-44-0	
Fluorene	61800	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	86-73-7	
Indeno(1,2,3-cd)pyrene	38800	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	193-39-5	
Naphthalene	42700	ug/kg	3240	50	03/27/18 15:20	04/04/18 11:45	91-20-3	
Phenanthrene	325000	ug/kg	16200	250	03/27/18 15:20	04/04/18 12:05	85-01-8	
Pyrene	195000	ug/kg	16200	250	03/27/18 15:20	04/04/18 12:05	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	50	03/27/18 15:20	04/04/18 11:45	321-60-8	D4,P3, S4
p-Terphenyl-d14 (S)	0	%	57-125	50	03/27/18 15:20	04/04/18 11:45	1718-51-0	S4
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	25057-89-0	
2,4-D	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	94-75-7	
2,4-DB	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	94-82-6	
Dicamba	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	1918-00-9	
Dinoseb	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	88-85-7	
MCPA	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	94-74-6	
Pentachlorophenol	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	87-86-5	
Picloram	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	1918-02-1	
2,4,5-T	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	93-72-1	
Triclopyr	ND	mg/kg	0.43	5	04/02/18 05:42	04/04/18 14:49	55335-06-3	
Surrogates								
2,4-DCAA (S)	69	%	46-125	5	04/02/18 05:42	04/04/18 14:49	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1890	1	03/27/18 14:03	03/27/18 18:32	67-64-1	
Allyl chloride	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	107-05-1	
Benzene	ND	ug/kg	37.7	1	03/27/18 14:03	03/27/18 18:32	71-43-2	
Bromobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	108-86-1	
Bromochloromethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	74-97-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) Lab ID: 10424937005 Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Bromodichloromethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	75-27-4	
Bromoform	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	75-25-2	
Bromomethane	ND	ug/kg	943	1	03/27/18 14:03	03/27/18 18:32	74-83-9	
2-Butanone (MEK)	ND	ug/kg	472	1	03/27/18 14:03	03/27/18 18:32	78-93-3	
n-Butylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	104-51-8	
sec-Butylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	135-98-8	
tert-Butylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	98-06-6	
Carbon tetrachloride	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	56-23-5	
Chlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	108-90-7	
Chloroethane	ND	ug/kg	943	1	03/27/18 14:03	03/27/18 18:32	75-00-3	
Chloroform	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	67-66-3	
Chloromethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	74-87-3	
2-Chlorotoluene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	95-49-8	
4-Chlorotoluene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	943	1	03/27/18 14:03	03/27/18 18:32	96-12-8	
Dibromochloromethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	106-93-4	
Dibromomethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	541-73-1	
1,4-Dichlorobenzene	132	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	75-71-8	
1,1-Dichloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	75-34-3	
1,2-Dichloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	107-06-2	
1,1-Dichloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	156-60-5	
Dichlorofluoromethane	ND	ug/kg	943	1	03/27/18 14:03	03/27/18 18:32	75-43-4	
1,2-Dichloropropane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	78-87-5	
1,3-Dichloropropane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	142-28-9	
2,2-Dichloropropane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	594-20-7	
1,1-Dichloropropene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	60-29-7	
Ethylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	472	1	03/27/18 14:03	03/27/18 18:32	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	98-82-8	
p-Isopropyltoluene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	99-87-6	
Methylene Chloride	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	472	1	03/27/18 14:03	03/27/18 18:32	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	1634-04-4	
Naphthalene	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	91-20-3	
n-Propylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	103-65-1	
Styrene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	630-20-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G3 (7-16wm) Lab ID: 10424937005 Collected: 03/26/18 16:35 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1,2,2-Tetrachloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	79-34-5	N2
Tetrachloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	127-18-4	
Tetrahydrofuran	ND	ug/kg	3770	1	03/27/18 14:03	03/27/18 18:32	109-99-9	
Toluene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	79-00-5	
Trichloroethene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	377	1	03/27/18 14:03	03/27/18 18:32	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	94.3	1	03/27/18 14:03	03/27/18 18:32	108-67-8	
Vinyl chloride	ND	ug/kg	37.7	1	03/27/18 14:03	03/27/18 18:32	75-01-4	
Xylene (Total)	ND	ug/kg	283	1	03/27/18 14:03	03/27/18 18:32	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%.	75-125	1	03/27/18 14:03	03/27/18 18:32	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	03/27/18 14:03	03/27/18 18:32	2037-26-5	
4-Bromofluorobenzene (S)	103	%.	75-125	1	03/27/18 14:03	03/27/18 18:32	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent ND mg/kg 12.8 5 04/02/18 15:00 04/04/18 13:18 18540-29-9 D3

Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent **40.2** mg/kg 1.0 1 04/10/18 07:11 16065-83-1

9012 Cyanide, Total

Analytical Method: EPA 9012 Preparation Method: EPA 9012A

Cyanide **0.62** mg/kg 0.52 1 03/29/18 10:55 03/29/18 13:22 57-12-5

9056 IC Anions

Analytical Method: EPA 9056A Preparation Method: EPA 300.0

Fluoride **2.0** mg/kg 0.99 1 03/30/18 14:00 04/02/18 20:37 16984-48-8

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	9.03	1	03/30/18 11:35	04/02/18 17:59	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	309-00-2	
alpha-BHC	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	319-84-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) **Lab ID: 10424937006** Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
beta-BHC	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	319-85-7	
delta-BHC	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	58-89-9	
Chlordane (Technical)	ND	ug/kg	48.9	2	03/28/18 12:51	04/05/18 20:41	57-74-9	
alpha-Chlordane	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	5103-71-9	
gamma-Chlordane	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	5103-74-2	
4,4'-DDD	19.8	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	72-54-8	
4,4'-DDE	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	72-55-9	
4,4'-DDT	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	50-29-3	
Dieldrin	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	60-57-1	
Endosulfan I	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	959-98-8	
Endosulfan II	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	33213-65-9	
Endosulfan sulfate	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	1031-07-8	
Endrin	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	72-20-8	
Endrin aldehyde	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	7421-93-4	
Endrin ketone	ND	ug/kg	9.8	2	03/28/18 12:51	04/05/18 20:41	53494-70-5	
Heptachlor	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	76-44-8	
Heptachlor epoxide	ND	ug/kg	4.9	2	03/28/18 12:51	04/05/18 20:41	1024-57-3	
Methoxychlor	ND	ug/kg	48.9	2	03/28/18 12:51	04/05/18 20:41	72-43-5	
Toxaphene	ND	ug/kg	146	2	03/28/18 12:51	04/05/18 20:41	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	72	%	30-150	2	03/28/18 12:51	04/05/18 20:41	877-09-8	5M, D4
Decachlorobiphenyl (S)	82	%	30-150	2	03/28/18 12:51	04/05/18 20:41	2051-24-3	
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA 3550						
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11141-16-5	
PCB-1242 (Aroclor 1242)	134	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	11100-14-4	
PCB, Total	134	ug/kg	48.4	1	03/28/18 12:51	04/02/18 11:15	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	89	%	48-125	1	03/28/18 12:51	04/02/18 11:15	877-09-8	
Decachlorobiphenyl (S)	83	%	30-134	1	03/28/18 12:51	04/02/18 11:15	2051-24-3	
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	287	mg/kg	63.9	5	03/27/18 16:31	03/30/18 14:00		T6
Surrogates								
n-Triacontane (S)	94	%	50-150	5	03/27/18 16:31	03/30/18 14:00	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	69.0	mg/kg	19.9	1	04/03/18 09:56	04/04/18 13:55		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) **Lab ID: 10424937006** Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Surrogates								
a,a,a-Trifluorotoluene (S)	97	%	80-150	1	04/03/18 09:56	04/04/18 13:55	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	13200	mg/kg	13.8	1	03/28/18 04:51	04/02/18 13:10	7429-90-5	
Barium	130	mg/kg	0.69	1	03/28/18 04:51	04/02/18 13:10	7440-39-3	
Boron	1930	mg/kg	10.4	1	03/28/18 04:51	04/02/18 13:10	7440-42-8	
Copper	29.1	mg/kg	0.69	1	03/28/18 04:51	04/02/18 13:10	7440-50-8	
Iron	39400	mg/kg	34.6	10	03/28/18 04:51	04/02/18 13:55	7439-89-6	
Manganese	188	mg/kg	0.35	1	03/28/18 04:51	04/02/18 13:10	7439-96-5	
Nickel	27.8	mg/kg	1.4	1	03/28/18 04:51	04/02/18 13:10	7440-02-0	
Silver	ND	mg/kg	0.69	1	03/28/18 04:51	04/02/18 13:10	7440-22-4	
Tin	5.3	mg/kg	5.2	1	03/28/18 04:51	04/02/18 13:10	7440-31-5	
Titanium	597	mg/kg	1.7	1	03/28/18 04:51	04/02/18 13:10	7440-32-6	
Zinc	209	mg/kg	1.4	1	03/28/18 04:51	04/02/18 13:10	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	57.6	mg/kg	1.4	5	03/30/18 09:43	03/31/18 06:37	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	2.0	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7440-36-0	
Arsenic	28.4	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7440-38-2	
Beryllium	3.0	mg/kg	0.28	20	03/28/18 04:52	03/30/18 18:21	7440-41-7	
Cadmium	3.1	mg/kg	0.11	20	03/28/18 04:52	03/30/18 18:21	7440-43-9	
Cobalt	7.4	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7440-48-4	
Lead	40.8	mg/kg	0.14	20	03/28/18 04:52	03/30/18 18:21	7439-92-1	
Lithium	13.0	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7439-93-2	
Selenium	7.4	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7782-49-2	
Strontium	83.5	mg/kg	0.71	20	03/28/18 04:52	03/30/18 18:21	7440-24-6	
Vanadium	120	mg/kg	1.4	20	03/28/18 04:52	03/30/18 18:21	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.094	mg/kg	0.028	1	03/28/18 04:53	03/30/18 13:06	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	31.8	%	0.10	1		03/28/18 12:46		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	83-32-9	
Acenaphthylene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	208-96-8	
Anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	120-12-7	
Benzo(a)anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	56-55-3	
Benzo(a)pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	191-24-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Benzo(k)fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	101-55-3	
Butylbenzylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	85-68-7	
Carbazole	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	59-50-7	
4-Chloroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	108-60-1	
2-Chloronaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	91-58-7	
2-Chlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	7005-72-3	
Chrysene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	53-70-3	
Dibenzofuran	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	120-83-2	
Diethylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	105-67-9	
Dimethylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	131-11-3	
Di-n-butylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2490	1	03/27/18 12:47	03/30/18 13:48	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	606-20-2	
Di-n-octylphthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	117-81-7	
Fluoranthene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	206-44-0	
Fluorene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	87-68-3	
Hexachlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	118-74-1	
Hexachloroethane	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	193-39-5	
Isophorone	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	78-59-1	
1-Methylnaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	90-12-0	
2-Methylnaphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	967	1	03/27/18 12:47	03/30/18 13:48		
Naphthalene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	91-20-3	
2-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	88-74-4	
3-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	99-09-2	
4-Nitroaniline	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	100-01-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

Nitrobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	98-95-3	
2-Nitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	88-75-5	
4-Nitrophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	86-30-6	
Pentachlorophenol	ND	ug/kg	982	1	03/27/18 12:47	03/30/18 13:48	87-86-5	
Phenanthrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	85-01-8	
Phenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	108-95-2	
Pyrene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	484	1	03/27/18 12:47	03/30/18 13:48	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	72	%.	43-125	1	03/27/18 12:47	03/30/18 13:48	4165-60-0	
2-Fluorobiphenyl (S)	79	%.	30-132	1	03/27/18 12:47	03/30/18 13:48	321-60-8	
p-Terphenyl-d14 (S)	98	%.	62-125	1	03/27/18 12:47	03/30/18 13:48	1718-51-0	
Phenol-d6 (S)	70	%.	48-125	1	03/27/18 12:47	03/30/18 13:48	13127-88-3	
2-Fluorophenol (S)	69	%.	40-125	1	03/27/18 12:47	03/30/18 13:48	367-12-4	
2,4,6-Tribromophenol (S)	83	%.	60-125	1	03/27/18 12:47	03/30/18 13:48	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	83-32-9	
Acenaphthylene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	208-96-8	
Anthracene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	120-12-7	
Benzo(a)anthracene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	207-08-9	
Chrysene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	53-70-3	
Fluoranthene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	206-44-0	
Fluorene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	193-39-5	
Naphthalene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	91-20-3	
Phenanthrene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	85-01-8	
Pyrene	ND	ug/kg	14.6	1	03/27/18 15:20	04/02/18 22:05	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	74	%.	42-125	1	03/27/18 15:20	04/02/18 22:05	321-60-8	
p-Terphenyl-d14 (S)	89	%.	57-125	1	03/27/18 15:20	04/02/18 22:05	1718-51-0	

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

Bentazon	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	25057-89-0	
2,4-D	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	94-75-7	
2,4-DB	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	94-82-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Dicamba	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	1918-00-9	
Dinoseb	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	88-85-7	
MCPA	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	94-74-6	
Pentachlorophenol	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	87-86-5	
Picloram	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	1918-02-1	
2,4,5-T	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	93-72-1	
Triclopyr	ND	mg/kg	0.048	1	03/29/18 07:30	04/04/18 17:16	55335-06-3	
Surrogates								
2,4-DCAA (S)	65	%.	46-125	1	03/29/18 07:30	04/04/18 17:16	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1650	1	03/27/18 14:03	03/27/18 18:49	67-64-1	
Allyl chloride	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	107-05-1	
Benzene	ND	ug/kg	33.1	1	03/27/18 14:03	03/27/18 18:49	71-43-2	
Bromobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	108-86-1	
Bromochloromethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	74-97-5	
Bromodichloromethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	75-27-4	
Bromoform	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	75-25-2	
Bromomethane	ND	ug/kg	827	1	03/27/18 14:03	03/27/18 18:49	74-83-9	
2-Butanone (MEK)	ND	ug/kg	414	1	03/27/18 14:03	03/27/18 18:49	78-93-3	
n-Butylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	104-51-8	
sec-Butylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	135-98-8	
tert-Butylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	98-06-6	
Carbon tetrachloride	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	56-23-5	
Chlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	108-90-7	
Chloroethane	ND	ug/kg	827	1	03/27/18 14:03	03/27/18 18:49	75-00-3	
Chloroform	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	67-66-3	
Chloromethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	74-87-3	
2-Chlorotoluene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	95-49-8	
4-Chlorotoluene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	827	1	03/27/18 14:03	03/27/18 18:49	96-12-8	
Dibromochloromethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	106-93-4	
Dibromomethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	75-71-8	
1,1-Dichloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	75-34-3	
1,2-Dichloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	107-06-2	
1,1-Dichloroethene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	75-35-4	
cis-1,2-Dichloroethene	263	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	156-60-5	
Dichlorofluoromethane	ND	ug/kg	827	1	03/27/18 14:03	03/27/18 18:49	75-43-4	
1,2-Dichloropropane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	78-87-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) Lab ID: 10424937006 Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,3-Dichloropropane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	142-28-9	
2,2-Dichloropropane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	594-20-7	
1,1-Dichloropropene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	60-29-7	
Ethylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	414	1	03/27/18 14:03	03/27/18 18:49	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	98-82-8	
p-Isopropyltoluene	131	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	99-87-6	
Methylene Chloride	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	414	1	03/27/18 14:03	03/27/18 18:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	1634-04-4	
Naphthalene	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	91-20-3	
n-Propylbenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	103-65-1	
Styrene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	79-34-5	N2
Tetrachloroethene	363	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	127-18-4	
Tetrahydrofuran	ND	ug/kg	3310	1	03/27/18 14:03	03/27/18 18:49	109-99-9	
Toluene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	79-00-5	
Trichloroethene	ND	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	331	1	03/27/18 14:03	03/27/18 18:49	76-13-1	
1,2,4-Trimethylbenzene	341	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	95-63-6	
1,3,5-Trimethylbenzene	172	ug/kg	82.7	1	03/27/18 14:03	03/27/18 18:49	108-67-8	
Vinyl chloride	ND	ug/kg	33.1	1	03/27/18 14:03	03/27/18 18:49	75-01-4	
Xylene (Total)	ND	ug/kg	248	1	03/27/18 14:03	03/27/18 18:49	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	03/27/18 14:03	03/27/18 18:49	17060-07-0	
Toluene-d8 (S)	100	%	75-125	1	03/27/18 14:03	03/27/18 18:49	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125	1	03/27/18 14:03	03/27/18 18:49	460-00-4	

7196 Chromium, Hexavalent

Analytical Method: EPA 7196A Preparation Method: EPA 3060A

Chromium, Hexavalent	ND	mg/kg	14.6	5	04/02/18 15:00	04/04/18 13:18	18540-29-9	D3
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Trivalent Chromium Calculation

Analytical Method: Trivalent Chromium Calculation

Chromium, Trivalent	57.6	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Sample: FD-SB-G2 (10-12wm) **Lab ID: 10424937006** Collected: 03/26/18 17:20 Received: 03/27/18 08:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9012 Cyanide, Total	Analytical Method: EPA 9012 Preparation Method: EPA 9012A							
Cyanide	0.56	mg/kg	0.56	1	03/29/18 10:55	03/29/18 13:22	57-12-5	
9056 IC Anions	Analytical Method: EPA 9056A Preparation Method: EPA 300.0							
Fluoride	7.4	mg/kg	1.0	1	03/30/18 14:00	04/02/18 21:35	16984-48-8	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 139779 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 553598 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/02/18 14:39	N3

METHOD BLANK: 553599 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/02/18 14:46	N3

METHOD BLANK: 553600 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.19	04/02/18 14:52	N3

LABORATORY CONTROL SAMPLE: 553601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	109	105	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553602 553603

Parameter	Units	10424249001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	22.5	480	482	389	390	76	76	65-135	0	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553604 553605

Parameter	Units	10424609001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	1000	932	788	743	79	80	65-135	6	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 530309 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2878459 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/03/18 12:36	
a,a,a-Trifluorotoluene (S)	%.	98	80-150	04/03/18 12:36	

LABORATORY CONTROL SAMPLE & LCSD: 2878460 2878461

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	43.7	49.5	87	99	80-120	12	20	
a,a,a-Trifluorotoluene (S)	%.				99	99	80-150			

MATRIX SPIKE SAMPLE: 2878564

Parameter	Units	10424937003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	70.3	70.9	100	80-120	
a,a,a-Trifluorotoluene (S)	%.				99	80-150	

SAMPLE DUPLICATE: 2878565

Parameter	Units	10425027002 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%.	99	100	8		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 529342 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873298 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	03/30/18 12:37	

LABORATORY CONTROL SAMPLE: 2873299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.51	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873300 2873301

Parameter	Units	10424793001		2873300		2873301		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Mercury	mg/kg	0.12	2.2	2.4	2.6	2.6	109	105	80-120	2	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529339 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873286 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	10.0	04/02/18 12:22	
Barium	mg/kg	ND	0.50	04/02/18 12:22	
Boron	mg/kg	ND	7.5	04/02/18 12:22	
Copper	mg/kg	ND	0.50	04/02/18 12:22	
Iron	mg/kg	24.4	2.5	04/02/18 12:22	
Manganese	mg/kg	ND	0.25	04/02/18 12:22	
Nickel	mg/kg	ND	1.0	04/02/18 12:22	
Silver	mg/kg	ND	0.50	04/02/18 12:22	
Tin	mg/kg	ND	3.8	04/02/18 12:22	
Titanium	mg/kg	ND	1.2	04/02/18 12:22	
Zinc	mg/kg	ND	1.0	04/02/18 12:22	

LABORATORY CONTROL SAMPLE: 2873287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	962	978	102	80-120	
Barium	mg/kg	48.1	50.1	104	80-120	
Boron	mg/kg	48.1	45.5	95	80-120	
Copper	mg/kg	48.1	47.2	98	80-120	
Iron	mg/kg	962	1000	104	80-120	
Manganese	mg/kg	48.1	50.6	105	80-120	
Nickel	mg/kg	48.1	49.2	102	80-120	
Silver	mg/kg	24	22.4	93	80-120	
Tin	mg/kg	48.1	49.1	102	80-120	
Titanium	mg/kg	48.1	48.7	101	80-120	
Zinc	mg/kg	48.1	48.2	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873288 2873289

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	Result							Result
Aluminum	mg/kg	5600	4830	4830	12100	12700	134	147	75-125	5	20	M1
Barium	mg/kg	252	241	241	474	480	92	95	75-125	1	20	
Boron	mg/kg	524	241	241	778	802	105	115	75-125	3	20	
Copper	mg/kg	24.2	241	241	275	298	104	113	75-125	8	20	
Iron	mg/kg	15500	4830	4830	18100	23200	55	161	75-125	25	20	M1,R1
Manganese	mg/kg	423	241	241	614	675	79	104	75-125	9	20	
Nickel	mg/kg	11.3	241	241	256	262	101	104	75-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2873288		2873289		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
		10424793001 Result	MS Spike Conc.	MSD Spike Conc.	RPD						RPD		
Silver	mg/kg	ND	121	121	113	110	93	91	75-125	2	20		
Tin	mg/kg	44.1	241	241	272	273	95	95	75-125	0	20		
Titanium	mg/kg	158	241	241	391	406	96	103	75-125	4	20		
Zinc	mg/kg	232	241	241	411	487	74	106	75-125	17	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 434613 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2007430 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	03/31/18 04:29	N2

LABORATORY CONTROL SAMPLE: 2007431

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.6	97	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2007432 2007433

Parameter	Units	2007432		2007433		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424609003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium	mg/kg	31.2	4.74	4.74	36.1	22.7	103	-179	75-125	46	20	1M, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529341 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873294 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	03/30/18 17:03	
Arsenic	mg/kg	ND	0.50	03/30/18 17:03	
Beryllium	mg/kg	ND	0.20	03/30/18 17:03	
Cadmium	mg/kg	ND	0.080	03/30/18 17:03	
Cobalt	mg/kg	ND	0.50	03/30/18 17:03	
Lead	mg/kg	ND	0.10	03/30/18 17:03	
Lithium	mg/kg	ND	0.50	03/30/18 17:03	
Selenium	mg/kg	ND	0.50	03/30/18 17:03	
Strontium	mg/kg	ND	0.50	03/30/18 17:03	
Vanadium	mg/kg	ND	1.0	03/30/18 17:03	

LABORATORY CONTROL SAMPLE: 2873295

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49.5	49.3	100	80-120	
Arsenic	mg/kg	49.5	49.1	99	80-120	
Beryllium	mg/kg	49.5	46.9	95	80-120	
Cadmium	mg/kg	49.5	48.8	99	80-120	
Cobalt	mg/kg	49.5	49.6	100	80-120	
Lead	mg/kg	49.5	50.3	102	80-120	
Lithium	mg/kg	49.5	45.7	92	80-120	
Selenium	mg/kg	49.5	48.0	97	80-120	
Strontium	mg/kg	49.5	48.3	98	80-120	
Vanadium	mg/kg	49.5	51.0	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873296 2873297

Parameter	Units	10424793001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Spike Conc.						
Antimony	mg/kg	ND	239	239	192	203	80	85	75-125	5	20	
Arsenic	mg/kg	3.8	239	239	223	236	92	97	75-125	5	20	
Beryllium	mg/kg	ND	239	239	219	234	91	98	75-125	7	20	
Cadmium	mg/kg	0.72	239	239	221	234	92	98	75-125	6	20	
Cobalt	mg/kg	3.4	239	239	228	242	94	100	75-125	6	20	
Lead	mg/kg	308	239	239	641	734	139	178	75-125	14	20 M6	
Lithium	mg/kg	4.6	239	239	216	232	88	95	75-125	7	20	
Selenium	mg/kg	ND	239	239	215	223	90	93	75-125	4	20	
Strontium	mg/kg	47.6	239	239	265	304	91	107	75-125	14	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2873296		2873297								
Parameter	Units	10424793001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Vanadium	mg/kg	15.0	239	239	247	275	97	109	75-125	11	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529276 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2872633 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/27/18 16:35	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/27/18 16:35	
1,1-Dichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,1-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
1,1-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,3-Trichloropropane	ug/kg	ND	200	03/27/18 16:35	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/27/18 16:35	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichloroethane	ug/kg	ND	50.0	03/27/18 16:35	
1,2-Dichloropropane	ug/kg	ND	50.0	03/27/18 16:35	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
1,3-Dichloropropane	ug/kg	ND	50.0	03/27/18 16:35	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
2,2-Dichloropropane	ug/kg	ND	200	03/27/18 16:35	
2-Butanone (MEK)	ug/kg	ND	250	03/27/18 16:35	
2-Chlorotoluene	ug/kg	ND	50.0	03/27/18 16:35	
4-Chlorotoluene	ug/kg	ND	50.0	03/27/18 16:35	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/27/18 16:35	
Acetone	ug/kg	ND	1000	03/27/18 16:35	
Allyl chloride	ug/kg	ND	200	03/27/18 16:35	
Benzene	ug/kg	ND	20.0	03/27/18 16:35	
Bromobenzene	ug/kg	ND	50.0	03/27/18 16:35	
Bromochloromethane	ug/kg	ND	50.0	03/27/18 16:35	
Bromodichloromethane	ug/kg	ND	50.0	03/27/18 16:35	
Bromoform	ug/kg	ND	200	03/27/18 16:35	
Bromomethane	ug/kg	ND	500	03/27/18 16:35	
Carbon tetrachloride	ug/kg	ND	50.0	03/27/18 16:35	
Chlorobenzene	ug/kg	ND	50.0	03/27/18 16:35	
Chloroethane	ug/kg	ND	500	03/27/18 16:35	
Chloroform	ug/kg	ND	50.0	03/27/18 16:35	
Chloromethane	ug/kg	ND	200	03/27/18 16:35	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

METHOD BLANK: 2872633

Matrix: Solid

Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/27/18 16:35	
Dibromomethane	ug/kg	ND	50.0	03/27/18 16:35	
Dichlorodifluoromethane	ug/kg	ND	200	03/27/18 16:35	
Dichlorofluoromethane	ug/kg	ND	500	03/27/18 16:35	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/27/18 16:35	
Ethylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/27/18 16:35	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/27/18 16:35	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/27/18 16:35	
Methylene Chloride	ug/kg	ND	200	03/27/18 16:35	
n-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
n-Propylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Naphthalene	ug/kg	ND	200	03/27/18 16:35	
p-Isopropyltoluene	ug/kg	ND	50.0	03/27/18 16:35	
sec-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Styrene	ug/kg	ND	50.0	03/27/18 16:35	
tert-Butylbenzene	ug/kg	ND	50.0	03/27/18 16:35	
Tetrachloroethene	ug/kg	ND	50.0	03/27/18 16:35	
Tetrahydrofuran	ug/kg	ND	2000	03/27/18 16:35	
Toluene	ug/kg	ND	50.0	03/27/18 16:35	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/27/18 16:35	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/27/18 16:35	
Trichloroethene	ug/kg	ND	50.0	03/27/18 16:35	N2
Trichlorofluoromethane	ug/kg	ND	200	03/27/18 16:35	
Vinyl chloride	ug/kg	ND	20.0	03/27/18 16:35	
Xylene (Total)	ug/kg	ND	150	03/27/18 16:35	
1,2-Dichloroethane-d4 (S)	%	91	75-125	03/27/18 16:35	
4-Bromofluorobenzene (S)	%	101	75-125	03/27/18 16:35	
Toluene-d8 (S)	%	98	75-125	03/27/18 16:35	

LABORATORY CONTROL SAMPLE & LCSD: 2872634

2872635

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	936	912	94	91	59-125	3	20	
1,1,1-Trichloroethane	ug/kg	1000	910	885	91	89	59-125	3	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	923	898	92	90	58-125	3	20	N2
1,1,2-Trichloroethane	ug/kg	1000	913	861	91	86	64-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	876	853	88	85	65-125	3	20	
1,1-Dichloroethane	ug/kg	1000	853	825	85	82	63-125	3	20	
1,1-Dichloroethene	ug/kg	1000	918	900	92	90	59-125	2	20	
1,1-Dichloropropene	ug/kg	1000	918	913	92	91	64-125	1	20	
1,2,3-Trichlorobenzene	ug/kg	1000	898	866	90	87	55-126	4	20	
1,2,3-Trichloropropane	ug/kg	1000	847	792	85	79	62-125	7	20	
1,2,4-Trichlorobenzene	ug/kg	1000	907	899	91	90	62-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

LABORATORY CONTROL SAMPLE & LCSD: 2872634		2872635									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,2,4-Trimethylbenzene	ug/kg	1000	895	876	90	88	59-125	2	20		
1,2-Dibromo-3-chloropropane	ug/kg	2500	2070	2030	83	81	54-125	2	20		
1,2-Dibromoethane (EDB)	ug/kg	1000	865	861	87	86	64-125	1	20		
1,2-Dichlorobenzene	ug/kg	1000	858	840	86	84	63-125	2	20		
1,2-Dichloroethane	ug/kg	1000	784	767	78	77	57-125	2	20		
1,2-Dichloropropane	ug/kg	1000	889	873	89	87	67-125	2	20		
1,3,5-Trimethylbenzene	ug/kg	1000	899	870	90	87	59-125	3	20		
1,3-Dichlorobenzene	ug/kg	1000	864	833	86	83	64-125	4	20		
1,3-Dichloropropane	ug/kg	1000	875	859	87	86	64-125	2	20		
1,4-Dichlorobenzene	ug/kg	1000	840	843	84	84	63-125	0	20		
2,2-Dichloropropane	ug/kg	1000	975	934	98	93	37-126	4	20		
2-Butanone (MEK)	ug/kg	5000	4040	4150	81	83	48-125	3	20		
2-Chlorotoluene	ug/kg	1000	870	844	87	84	62-125	3	20		
4-Chlorotoluene	ug/kg	1000	893	868	89	87	63-125	3	20		
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4230	4170	85	83	52-135	1	20		
Acetone	ug/kg	5000	5930	5540	119	111	65-125	7	20		
Allyl chloride	ug/kg	1000	861	838	86	84	52-125	3	20		
Benzene	ug/kg	1000	870	836	87	84	61-125	4	20		
Bromobenzene	ug/kg	1000	896	858	90	86	64-125	4	20		
Bromochloromethane	ug/kg	1000	902	848	90	85	65-125	6	20		
Bromodichloromethane	ug/kg	1000	956	912	96	91	57-125	5	20		
Bromoform	ug/kg	1000	857	861	86	86	57-125	0	20		
Bromomethane	ug/kg	1000	761	842	76	84	60-125	10	20		
Carbon tetrachloride	ug/kg	1000	936	894	94	89	58-125	5	20		
Chlorobenzene	ug/kg	1000	891	868	89	87	66-125	3	20		
Chloroethane	ug/kg	1000	808	861	81	86	62-125	6	20		
Chloroform	ug/kg	1000	780	773	78	77	59-125	1	20		
Chloromethane	ug/kg	1000	777	793	78	79	50-125	2	20		
cis-1,2-Dichloroethene	ug/kg	1000	871	844	87	84	61-125	3	20		
cis-1,3-Dichloropropene	ug/kg	1000	920	884	92	88	61-125	4	20		
Dibromochloromethane	ug/kg	1000	873	836	87	84	60-125	4	20		
Dibromomethane	ug/kg	1000	919	879	92	88	69-125	4	20		
Dichlorodifluoromethane	ug/kg	1000	692	727	69	73	38-125	5	20		
Dichlorofluoromethane	ug/kg	1000	781	830	78	83	67-125	6	20		
Diethyl ether (Ethyl ether)	ug/kg	1000	1440	1560	144	156	60-125	8	20 L3		
Ethylbenzene	ug/kg	1000	885	876	89	88	62-125	1	20		
Hexachloro-1,3-butadiene	ug/kg	1000	929	952	93	95	56-125	2	20		
Isopropylbenzene (Cumene)	ug/kg	1000	945	925	94	92	65-125	2	20		
Methyl-tert-butyl ether	ug/kg	1000	834	815	83	82	59-125	2	20		
Methylene Chloride	ug/kg	1000	905	859	91	86	64-125	5	20		
n-Butylbenzene	ug/kg	1000	931	914	93	91	59-125	2	20		
n-Propylbenzene	ug/kg	1000	920	887	92	89	61-125	4	20		
Naphthalene	ug/kg	1000	909	917	91	92	53-125	1	20		
p-Isopropyltoluene	ug/kg	1000	911	904	91	90	63-125	1	20		
sec-Butylbenzene	ug/kg	1000	937	918	94	92	62-125	2	20		
Styrene	ug/kg	1000	939	902	94	90	66-125	4	20		
tert-Butylbenzene	ug/kg	1000	914	898	91	90	64-125	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2872634		2872635			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Tetrachloroethene	ug/kg	1000	916	895	92	89	67-125	2	20	
Tetrahydrofuran	ug/kg	10000	12300	11600	123	116	62-125	6	20	
Toluene	ug/kg	1000	886	876	89	88	61-125	1	20	
trans-1,2-Dichloroethene	ug/kg	1000	901	885	90	89	64-125	2	20	
trans-1,3-Dichloropropene	ug/kg	1000	931	929	93	93	56-125	0	20	
Trichloroethene	ug/kg	1000	892	866	89	87	67-125	3	20	N2
Trichlorofluoromethane	ug/kg	1000	753	816	75	82	65-125	8	20	
Vinyl chloride	ug/kg	1000	851	883	85	88	57-125	4	20	
Xylene (Total)	ug/kg	3000	2710	2690	90	90	62-125	1	20	
1,2-Dichloroethane-d4 (S)	%				92	91	75-125			
4-Bromofluorobenzene (S)	%				100	102	75-125			
Toluene-d8 (S)	%				99	101	75-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529466 Analysis Method: EPA 8081B
 QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873686 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDE	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDT	ug/kg	ND	3.3	04/05/18 18:14	
Aldrin	ug/kg	ND	1.7	04/05/18 18:14	
alpha-BHC	ug/kg	ND	1.7	04/05/18 18:14	
alpha-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
beta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Chlordane (Technical)	ug/kg	ND	16.7	04/05/18 18:14	
delta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Dieldrin	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan I	ug/kg	ND	1.7	04/05/18 18:14	
Endosulfan II	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan sulfate	ug/kg	ND	3.3	04/05/18 18:14	
Endrin	ug/kg	ND	3.3	04/05/18 18:14	
Endrin aldehyde	ug/kg	ND	3.3	04/05/18 18:14	
Endrin ketone	ug/kg	ND	3.3	04/05/18 18:14	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/05/18 18:14	
gamma-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor epoxide	ug/kg	ND	1.7	04/05/18 18:14	
Methoxychlor	ug/kg	ND	16.7	04/05/18 18:14	
Toxaphene	ug/kg	ND	50.0	04/05/18 18:14	
Decachlorobiphenyl (S)	%	95	30-150	04/05/18 18:14	
Tetrachloro-m-xylene (S)	%	91	30-150	04/05/18 18:14	

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.1	99	62-127	
4,4'-DDE	ug/kg	33.3	32.4	97	66-125	
4,4'-DDT	ug/kg	33.3	33.2	99	67-128 CH	
Aldrin	ug/kg	16.7	14.5	87	66-125	
alpha-BHC	ug/kg	16.7	14.8	89	64-125	
alpha-Chlordane	ug/kg	16.7	15.2	91	68-125	
beta-BHC	ug/kg	16.7	15.3	92	69-125	
delta-BHC	ug/kg	16.7	9.8	59	42-133	
Dieldrin	ug/kg	33.3	33.7	101	69-126	
Endosulfan I	ug/kg	16.7	14.1	85	63-125	
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	27.6	83	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.1	93	69-125	
Endrin aldehyde	ug/kg	33.3	31.3	94	65-125	
Endrin ketone	ug/kg	33.3	34.0	102	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.3	92	67-125	
gamma-Chlordane	ug/kg	16.7	13.8	83	63-125	
Heptachlor	ug/kg	16.7	15.3	92	69-125	
Heptachlor epoxide	ug/kg	16.7	15.3	92	68-125	
Methoxychlor	ug/kg	167	165	99	65-134	CH
Decachlorobiphenyl (S)	%			90	30-150	
Tetrachloro-m-xylene (S)	%			86	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873688 2873689

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424793001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	166	166	147	154	89	93	56-125	5	20	
4,4'-DDE	ug/kg	ND	166	166	154	164	93	99	32-150	6	20	
4,4'-DDT	ug/kg	ND	166	166	154	158	93	95	60-132	2	20	CH
Aldrin	ug/kg	ND	82.5	83	61.8	64.2	75	78	56-125	4	20	
alpha-BHC	ug/kg	ND	82.5	83	74.1	80.9	90	98	54-136	9	20	
alpha-Chlordane	ug/kg	147	82.5	83	169	140	26	-9	54-133	19	20	M1
beta-BHC	ug/kg	64.3	82.5	83	79.8	87.9	19	28	30-150	10	20	M1
delta-BHC	ug/kg	ND	82.5	83	49.8	54.9	60	66	45-145	10	20	
Dieldrin	ug/kg	ND	166	166	142	143	86	86	47-150	0	20	
Endosulfan I	ug/kg	ND	82.5	83	66.2	70.2	80	85	35-145	6	20	
Endosulfan II	ug/kg	ND	166	166	139	142	84	86	50-147	2	20	
Endosulfan sulfate	ug/kg	ND	166	166	118	120	71	73	54-132	2	20	
Endrin	ug/kg	ND	166	166	126	128	76	78	62-125	2	20	
Endrin aldehyde	ug/kg	ND	166	166	132	132	80	80	33-150	1	20	
Endrin ketone	ug/kg	ND	166	166	144	146	87	88	56-144	1	20	
gamma-BHC (Lindane)	ug/kg	ND	82.5	83	66.3	68.3	80	82	63-125	3	20	
gamma-Chlordane	ug/kg	129	82.5	83	141	118	14	-14	45-132	18	20	M1
Heptachlor	ug/kg	ND	82.5	83	77.5	95.3	94	115	51-142	21	20	R1
Heptachlor epoxide	ug/kg	ND	82.5	83	65.2	69.5	79	84	50-142	6	20	
Methoxychlor	ug/kg	ND	825	830	810	820	98	99	58-139	1	20	CH
Decachlorobiphenyl (S)	%						60	64	30-150			
Tetrachloro-m-xylene (S)	%						57	64	30-150			5M,D4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529467 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2873690 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/02/18 10:11	
Decachlorobiphenyl (S)	%	88	30-134	04/02/18 10:11	
Tetrachloro-m-xylene (S)	%	88	48-125	04/02/18 10:11	

LABORATORY CONTROL SAMPLE: 2873691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	569	85	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	575	86	62-125	
Decachlorobiphenyl (S)	%			90	30-134	
Tetrachloro-m-xylene (S)	%			90	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873692 2873693

Parameter	Units	10424793002		2873692		2873693		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
PCB-1016 (Aroclor 1016)	ug/kg	ND	930	930	789	769	85	83	30-150	3	30		
PCB-1260 (Aroclor 1260)	ug/kg	ND	930	930	906	896	97	96	30-138	1	30		
Decachlorobiphenyl (S)	%						77	74	30-134				
Tetrachloro-m-xylene (S)	%						76	69	48-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529268 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2872570 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,2-Diphenylhydrazine	ug/kg	ND	330	03/30/18 11:47	
1,3-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1,4-Dichlorobenzene	ug/kg	ND	330	03/30/18 11:47	
1-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2,4,5-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Trichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dichlorophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dimethylphenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrophenol	ug/kg	ND	330	03/30/18 11:47	
2,4-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2,6-Dinitrotoluene	ug/kg	ND	330	03/30/18 11:47	
2-Chloronaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Chlorophenol	ug/kg	ND	330	03/30/18 11:47	
2-Methylnaphthalene	ug/kg	ND	330	03/30/18 11:47	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	03/30/18 11:47	
2-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
2-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	03/30/18 11:47	
3,3'-Dichlorobenzidine	ug/kg	ND	330	03/30/18 11:47	
3-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	03/30/18 11:47	
4-Bromophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Chloro-3-methylphenol	ug/kg	ND	330	03/30/18 11:47	
4-Chloroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Chlorophenylphenyl ether	ug/kg	ND	330	03/30/18 11:47	
4-Nitroaniline	ug/kg	ND	330	03/30/18 11:47	
4-Nitrophenol	ug/kg	ND	330	03/30/18 11:47	
Acenaphthene	ug/kg	ND	330	03/30/18 11:47	
Acenaphthylene	ug/kg	ND	330	03/30/18 11:47	
Anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)anthracene	ug/kg	ND	330	03/30/18 11:47	
Benzo(a)pyrene	ug/kg	ND	330	03/30/18 11:47	
Benzo(b)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Benzo(g,h,i)perylene	ug/kg	ND	330	03/30/18 11:47	
Benzo(k)fluoranthene	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroethyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	03/30/18 11:47	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	03/30/18 11:47	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

METHOD BLANK: 2872570

Matrix: Solid

Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	03/30/18 11:47	
Carbazole	ug/kg	ND	330	03/30/18 11:47	
Chrysene	ug/kg	ND	330	03/30/18 11:47	
Di-n-butylphthalate	ug/kg	ND	330	03/30/18 11:47	
Di-n-octylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dibenz(a,h)anthracene	ug/kg	ND	330	03/30/18 11:47	
Dibenzofuran	ug/kg	ND	330	03/30/18 11:47	
Diethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Dimethylphthalate	ug/kg	ND	330	03/30/18 11:47	
Fluoranthene	ug/kg	ND	330	03/30/18 11:47	
Fluorene	ug/kg	ND	330	03/30/18 11:47	
Hexachloro-1,3-butadiene	ug/kg	ND	330	03/30/18 11:47	
Hexachlorobenzene	ug/kg	ND	330	03/30/18 11:47	
Hexachloroethane	ug/kg	ND	330	03/30/18 11:47	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	03/30/18 11:47	
Isophorone	ug/kg	ND	330	03/30/18 11:47	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodimethylamine	ug/kg	ND	330	03/30/18 11:47	
N-Nitrosodiphenylamine	ug/kg	ND	330	03/30/18 11:47	
Naphthalene	ug/kg	ND	330	03/30/18 11:47	
Nitrobenzene	ug/kg	ND	330	03/30/18 11:47	
Pentachlorophenol	ug/kg	ND	670	03/30/18 11:47	
Phenanthrene	ug/kg	ND	330	03/30/18 11:47	
Phenol	ug/kg	ND	330	03/30/18 11:47	
Pyrene	ug/kg	ND	330	03/30/18 11:47	
2,4,6-Tribromophenol (S)	%	73	60-125	03/30/18 11:47	
2-Fluorobiphenyl (S)	%	58	30-132	03/30/18 11:47	
2-Fluorophenol (S)	%	55	40-125	03/30/18 11:47	
Nitrobenzene-d5 (S)	%	54	43-125	03/30/18 11:47	
p-Terphenyl-d14 (S)	%	90	62-125	03/30/18 11:47	
Phenol-d6 (S)	%	56	48-125	03/30/18 11:47	

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1020	61	46-125	
1,2-Dichlorobenzene	ug/kg	1670	999	60	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1310	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1010	61	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1010	61	39-125	
1-Methylnaphthalene	ug/kg	1670	1080	65	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1220	73	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1200	72	61-125	
2,4-Dichlorophenol	ug/kg	1670	1060	64	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1030	62	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1250	75	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1240	74	63-125	
2-Chloronaphthalene	ug/kg	1670	1130	68	61-125	
2-Chlorophenol	ug/kg	1670	1020	61	46-125	
2-Methylnaphthalene	ug/kg	1670	1080	65	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1080	65	50-125	
2-Nitroaniline	ug/kg	1670	1380	83	61-125	
2-Nitrophenol	ug/kg	1670	1030	62	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1080	65	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1290	78	47-125	
3-Nitroaniline	ug/kg	1670	1220	73	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1380J	83	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1350	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1180	71	64-125	
4-Chloroaniline	ug/kg	1670	944	57	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1210	73	64-125	
4-Nitroaniline	ug/kg	1670	1180	71	59-125	
4-Nitrophenol	ug/kg	1670	1320	79	54-125	
Acenaphthene	ug/kg	1670	1190	72	62-125	
Acenaphthylene	ug/kg	1670	1140	69	61-125	
Anthracene	ug/kg	1670	1280	77	66-125	
Benzo(a)anthracene	ug/kg	1670	1300	78	69-125	
Benzo(a)pyrene	ug/kg	1670	1310	79	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1380	83	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1320	79	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1300	78	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1120	67	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1090	65	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1180	71	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1330	80	69-131	
Butylbenzylphthalate	ug/kg	1670	1340	81	69-129	
Carbazole	ug/kg	1670	1290	77	66-125	
Chrysene	ug/kg	1670	1300	78	68-125	
Di-n-butylphthalate	ug/kg	1670	1360	81	69-125	
Di-n-octylphthalate	ug/kg	1670	1310	79	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1340	81	64-125	
Dibenzofuran	ug/kg	1670	1200	72	65-125	
Diethylphthalate	ug/kg	1670	1280	77	67-125	
Dimethylphthalate	ug/kg	1670	1240	75	67-125	
Fluoranthene	ug/kg	1670	1280	77	66-125	
Fluorene	ug/kg	1670	1190	71	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1040	62	40-125	
Hexachlorobenzene	ug/kg	1670	1320	79	62-125	
Hexachloroethane	ug/kg	1670	1010	61	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1320	79	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

LABORATORY CONTROL SAMPLE: 2872571

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1130	68	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1150	69	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1090	65	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1320	79	65-125	
Naphthalene	ug/kg	1670	1050	63	48-125	
Nitrobenzene	ug/kg	1670	1130	68	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1300	78	66-125	
Phenol	ug/kg	1670	1110	67	46-125	
Pyrene	ug/kg	1670	1360	82	69-125	
2,4,6-Tribromophenol (S)	%			85	60-125	
2-Fluorobiphenyl (S)	%			76	30-132	
2-Fluorophenol (S)	%			69	40-125	
Nitrobenzene-d5 (S)	%			71	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			72	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788 2872789

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424792001 Result	Spike Conc.	Spike Conc.	MS Result						
1,2,4-Trichlorobenzene	ug/kg	ND	1720	1710	1460J	1420J	85	83	30-127	30	
1,2-Dichlorobenzene	ug/kg	ND	1720	1710	1360J	1370J	79	80	30-125	30	
1,2-Diphenylhydrazine	ug/kg	ND	1720	1710	1710	1620J	100	95	30-150	30	
1,3-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1320J	82	77	30-125	30	
1,4-Dichlorobenzene	ug/kg	ND	1720	1710	1400J	1350J	82	79	30-125	30	
1-Methylnaphthalene	ug/kg	ND	1720	1710	1540J	1510J	90	88	42-125	30	
2,4,5-Trichlorophenol	ug/kg	ND	1720	1710	1470J	1350J	86	79	30-150	30	
2,4,6-Trichlorophenol	ug/kg	ND	1720	1710	1330J	1320J	78	77	30-150	30	
2,4-Dichlorophenol	ug/kg	ND	1720	1710	1550J	1480J	91	87	30-135	30	
2,4-Dimethylphenol	ug/kg	ND	1720	1710	1440J	1430J	84	84	30-148	30	
2,4-Dinitrophenol	ug/kg	ND	1720	1710	ND	ND	5	4	30-125	30	M1
2,4-Dinitrotoluene	ug/kg	ND	1720	1710	1560J	1560J	91	92	30-150	30	
2,6-Dinitrotoluene	ug/kg	ND	1720	1710	1650J	1720	96	100	30-150	30	
2-Chloronaphthalene	ug/kg	ND	1720	1710	1580J	1500J	92	88	30-138	30	
2-Chlorophenol	ug/kg	ND	1720	1710	1500J	1450J	88	85	30-130	30	
2-Methylnaphthalene	ug/kg	ND	1720	1710	1530J	1640J	89	96	46-125	30	
2-Methylphenol(o-Cresol)	ug/kg	ND	1720	1710	1590J	1490J	93	87	30-133	30	
2-Nitroaniline	ug/kg	ND	1720	1710	1650J	1750	97	103	30-150	30	
2-Nitrophenol	ug/kg	ND	1720	1710	1360J	1410J	79	83	30-134	30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1720	1710	1600J	1590J	94	93	30-138	30	
3,3'-Dichlorobenzidine	ug/kg	ND	1720	1710	1340J	1500J	78	88	30-149	30	6M
3-Nitroaniline	ug/kg	ND	1720	1710	1300J	1180J	76	69	30-150	30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1720	1710	ND	ND	19	20	30-133	30	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872788			2872789									
Parameter	Units	10424792001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual	
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		
4-Bromophenylphenyl ether	ug/kg	ND	1720	1710	1670J	1600J	97	94	44-125		30	
4-Chloro-3-methylphenol	ug/kg	ND	1720	1710	1580J	ND	92	99	30-150		30	
4-Chloroaniline	ug/kg	ND	1720	1710	1010J	930J	59	54	30-125		30	
4-Chlorophenylphenyl ether	ug/kg	ND	1720	1710	1630J	1540J	95	90	44-125		30	
4-Nitroaniline	ug/kg	ND	1720	1710	1500J	1440J	87	84	30-150		30	
4-Nitrophenol	ug/kg	ND	1720	1710	1450J	1370J	85	80	30-150		30	
Acenaphthene	ug/kg	ND	1720	1710	1490J	1430J	87	84	40-125		30	
Acenaphthylene	ug/kg	ND	1720	1710	1560J	1470J	91	86	30-150		30	
Anthracene	ug/kg	ND	1720	1710	1770	1800	103	106	30-150	2	30	
Benzo(a)anthracene	ug/kg	ND	1720	1710	1970	1970	115	115	30-150	0	30	
Benzo(a)pyrene	ug/kg	ND	1720	1710	1860	1850	109	108	30-150	1	30	
Benzo(b)fluoranthene	ug/kg	ND	1720	1710	1560J	1770	91	104	30-150		30	
Benzo(g,h,i)perylene	ug/kg	ND	1720	1710	1600J	1710	93	100	30-150		30	
Benzo(k)fluoranthene	ug/kg	ND	1720	1710	1660J	1550J	97	91	30-150		30	
bis(2-Chloroethoxy)methane	ug/kg	ND	1720	1710	1520J	1460J	89	85	30-134		30	
bis(2-Chloroethyl) ether	ug/kg	ND	1720	1710	1570J	1550J	91	91	30-125		30 6M	
bis(2-Chloroisopropyl) ether	ug/kg	ND	1720	1710	1780	1600J	104	94	30-125		30 6M	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1720	1710	1780	1880	104	110	30-150	5	30	
Butylbenzylphthalate	ug/kg	ND	1720	1710	1740	1790	102	105	30-150	3	30	
Carbazole	ug/kg	ND	1720	1710	1660J	1710	97	100	41-125		30	
Chrysene	ug/kg	ND	1720	1710	2070	2030	121	119	30-150	2	30	
Di-n-butylphthalate	ug/kg	ND	1720	1710	1730	1740	101	102	30-150	0	30	
Di-n-octylphthalate	ug/kg	ND	1720	1710	1840	1870	108	110	30-150	2	30	
Dibenz(a,h)anthracene	ug/kg	ND	1720	1710	1540J	1680J	90	98	30-150		30	
Dibenzofuran	ug/kg	ND	1720	1710	1620J	1590J	95	93	45-125		30	
Diethylphthalate	ug/kg	ND	1720	1710	1680J	1660J	98	97	30-150		30	
Dimethylphthalate	ug/kg	ND	1720	1710	1650J	1630J	97	96	30-150		30	
Fluoranthene	ug/kg	ND	1720	1710	1750	1740	102	102	30-150	0	30	
Fluorene	ug/kg	ND	1720	1710	1620J	1660J	95	97	30-150		30	
Hexachloro-1,3-butadiene	ug/kg	ND	1720	1710	1380J	1460J	80	86	30-128		30	
Hexachlorobenzene	ug/kg	ND	1720	1710	1500J	1500J	87	88	30-150		30	
Hexachloroethane	ug/kg	ND	1720	1710	1440J	1350J	84	79	30-125		30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1720	1710	1500J	1650J	88	97	30-150		30	
Isophorone	ug/kg	ND	1720	1710	1570J	1550J	92	91	30-140		30	
N-Nitroso-di-n-propylamine	ug/kg	ND	1720	1710	1680J	1570J	98	92	30-147		30 6M	
N-Nitrosodimethylamine	ug/kg	ND	1720	1710	1420J	1330J	83	78	30-125		30	
N-Nitrosodiphenylamine	ug/kg	ND	1720	1710	1610J	1720	94	101	30-150		30	
Naphthalene	ug/kg	ND	1720	1710	1520J	1480J	89	86	44-125		30	
Nitrobenzene	ug/kg	ND	1720	1710	1580J	1550J	92	91	30-136		30	
Pentachlorophenol	ug/kg	ND	1720	1710	ND	ND	23	22	30-150		30 M1	
Phenanthrene	ug/kg	ND	1720	1710	1890	1950	110	114	30-150	3	30	
Phenol	ug/kg	ND	1720	1710	1530J	1490J	89	87	30-129		30	
Pyrene	ug/kg	ND	1720	1710	2160	2260	126	132	30-150	4	30	
2,4,6-Tribromophenol (S)	%						86	83	60-125			
2-Fluorobiphenyl (S)	%						98	95	30-132			
2-Fluorophenol (S)	%						95	88	40-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2872788		2872789		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					93	93	43-125			
p-Terphenyl-d14 (S)	%.					97	103	62-125			
Phenol-d6 (S)	%.					95	93	48-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529263 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2872540 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/02/18 12:14	
Acenaphthylene	ug/kg	ND	10.0	04/02/18 12:14	
Anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(a)anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(a)pyrene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/02/18 12:14	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Chrysene	ug/kg	ND	10.0	04/02/18 12:14	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/02/18 12:14	
Fluoranthene	ug/kg	ND	10.0	04/02/18 12:14	
Fluorene	ug/kg	ND	10.0	04/02/18 12:14	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/02/18 12:14	
Naphthalene	ug/kg	ND	10.0	04/02/18 12:14	
Phenanthrene	ug/kg	ND	10.0	04/02/18 12:14	
Pyrene	ug/kg	ND	10.0	04/02/18 12:14	
2-Fluorobiphenyl (S)	%	84	42-125	04/02/18 12:14	
p-Terphenyl-d14 (S)	%	100	57-125	04/02/18 12:14	

LABORATORY CONTROL SAMPLE: 2872541

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.2	73	52-125	
Acenaphthylene	ug/kg	33.3	26.1	78	50-125	
Anthracene	ug/kg	33.3	30.0	90	65-125	
Benzo(a)anthracene	ug/kg	33.3	31.8	95	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.2	90	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.1	93	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	26.3	79	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.3	88	67-125	
Chrysene	ug/kg	33.3	28.6	86	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	25.8	77	63-125	
Fluoranthene	ug/kg	33.3	30.2	91	75-125	
Fluorene	ug/kg	33.3	25.3	76	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	26.4	79	63-125	
Naphthalene	ug/kg	33.3	26.1	78	49-125	
Phenanthrene	ug/kg	33.3	25.1	75	65-125	
Pyrene	ug/kg	33.3	31.2	94	64-125	
2-Fluorobiphenyl (S)	%			78	42-125	
p-Terphenyl-d14 (S)	%			97	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2872542		2872543		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10424778001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	36.5	36.6	27.7J	25.3J	76	69	30-125		30		
Acenaphthylene	ug/kg	ND	36.5	36.6	74.3J	57.6J	203	157	30-133		30	M1	
Anthracene	ug/kg	ND	36.5	36.6	76.5J	62.4J	209	170	30-150		30	M1	
Benzo(a)anthracene	ug/kg	ND	36.5	36.6	117	64.1J	319	175	30-150		30	M1	
Benzo(a)pyrene	ug/kg	ND	36.5	36.6	205	148	559	404	30-150	32	30	M1, R1	
Benzo(b)fluoranthene	ug/kg	ND	36.5	36.6	201	135	551	370	30-150	39	30	M1, R1	
Benzo(g,h,i)perylene	ug/kg	0.16 mg/kg	36.5	36.6	275	218	317	158	30-150	23	30	M1	
Benzo(k)fluoranthene	ug/kg	ND	36.5	36.6	94.9J	67.8J	260	185	30-150		30	M1	
Chrysene	ug/kg	ND	36.5	36.6	148	83.8J	406	229	30-150		30	M1	
Dibenz(a,h)anthracene	ug/kg	ND	36.5	36.6	80.8J	61.4J	221	168	30-131		30	M1	
Fluoranthene	ug/kg	ND	36.5	36.6	139	80.6J	380	220	30-150		30	M1	
Fluorene	ug/kg	ND	36.5	36.6	32J	26.3J	88	72	30-147		30		
Indeno(1,2,3-cd)pyrene	ug/kg	ND	36.5	36.6	169	125	463	342	30-150	30	30	M1	
Naphthalene	ug/kg	ND	36.5	36.6	25.2J	22.3J	69	61	30-131		30		
Phenanthrene	ug/kg	ND	36.5	36.6	41.7J	34.5J	114	94	30-150		30		
Pyrene	ug/kg	ND	36.5	36.6	139	74.2J	381	202	30-150		30	M1	
2-Fluorobiphenyl (S)	%.						82	71	42-125				P3
p-Terphenyl-d14 (S)	%.						74	66	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529569 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937006

METHOD BLANK: 2874519 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 13:35	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 13:35	
2,4-D	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DB	mg/kg	ND	0.033	04/04/18 13:35	
Bentazon	mg/kg	ND	0.033	04/04/18 13:35	
Dicamba	mg/kg	ND	0.033	04/04/18 13:35	
Dinoseb	mg/kg	ND	0.033	04/04/18 13:35	
MCPA	mg/kg	ND	0.033	04/04/18 13:35	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 13:35	
Picloram	mg/kg	ND	0.033	04/04/18 13:35	
Triclopyr	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DCAA (S)	%	78	46-125	04/04/18 13:35	

LABORATORY CONTROL SAMPLE: 2874520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.28	83	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	79	61-125	
2,4-D	mg/kg	.33	0.29	86	63-125	
2,4-DB	mg/kg	.33	0.28	83	59-125	
Bentazon	mg/kg	.33	0.25	76	58-125	
Dicamba	mg/kg	.33	0.27	80	52-125	
Dinoseb	mg/kg	.33	0.18	53	35-126	
MCPA	mg/kg	.33	0.27	82	57-125	
Pentachlorophenol	mg/kg	.33	0.21	63	48-125	
Picloram	mg/kg	.33	0.24	72	47-125	
Triclopyr	mg/kg	.33	0.28	83	68-125	
2,4-DCAA (S)	%			77	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521 2874522

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111006 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
2,4,5-T	mg/kg	ND	.45	.45	0.19	0.21	42	45	30-145	8	20	
2,4,5-TP (Silvex)	mg/kg	ND	.45	.45	0.28	0.26	63	58	30-130	7	20	
2,4-D	mg/kg	ND	.45	.45	0.18	0.20	40	44	30-150	9	20	
2,4-DB	mg/kg	ND	.45	.45	0.35	0.33	77	72	45-126	7	20	
Bentazon	mg/kg	ND	.45	.45	0.33	0.32	73	71	30-133	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Parameter	Units	2874521		2874522		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10425111006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dicamba	mg/kg	ND	.45	.45	0.13	0.17	29	38	30-140	28	20	M1, R1	
Dinoseb	mg/kg	ND	.45	.45	0.39	0.31	86	69	30-136	23	20	R1	
MCPA	mg/kg	ND	.45	.45	0.24	0.22	53	49	30-136	9	20		
Pentachlorophenol	mg/kg	ND	.45	.45	0.28	0.25	63	55	44-125	13	20		
Picloram	mg/kg	ND	.45	.45	.016J	0.098	3	22	30-125		20	M1	
Triclopyr	mg/kg	ND	.45	.45	0.23	0.22	51	50	30-149	3	20		
2,4-DCAA (S)	%.						65	60	46-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 530039	Analysis Method: EPA 8270D
QC Batch Method: EPA 3546	Analysis Description: MDA2 Solid MSSV
Associated Lab Samples: 10424937005	

METHOD BLANK: 2877307 Matrix: Solid

Associated Lab Samples: 10424937005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 14:05	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 14:05	
2,4-D	mg/kg	ND	0.033	04/04/18 14:05	
2,4-DB	mg/kg	ND	0.033	04/04/18 14:05	
Bentazon	mg/kg	ND	0.033	04/04/18 14:05	
Dicamba	mg/kg	ND	0.033	04/04/18 14:05	
Dinoseb	mg/kg	ND	0.033	04/04/18 14:05	
MCPA	mg/kg	ND	0.033	04/04/18 14:05	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 14:05	
Picloram	mg/kg	ND	0.033	04/04/18 14:05	
Triclopyr	mg/kg	ND	0.033	04/04/18 14:05	
2,4-DCAA (S)	%	82	46-125	04/04/18 14:05	

LABORATORY CONTROL SAMPLE & LCSD: 2877308 2877550

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,5-T	mg/kg	.33	0.31	0.30	92	91	60-125	1	20	
2,4,5-TP (Silvex)	mg/kg	.33	0.30	0.29	89	87	61-125	2	20	
2,4-D	mg/kg	.33	0.31	0.31	92	93	63-125	2	20	
2,4-DB	mg/kg	.33	0.30	0.30	91	90	59-125	1	20	
Bentazon	mg/kg	.33	0.27	0.26	82	79	58-125	4	20	
Dicamba	mg/kg	.33	0.29	0.30	86	89	52-125	4	20	
Dinoseb	mg/kg	.33	0.21	0.22	64	66	35-126	4	20	
MCPA	mg/kg	.33	0.29	0.29	88	87	57-125	2	20	
Pentachlorophenol	mg/kg	.33	0.22	0.22	65	66	48-125	1	20	
Picloram	mg/kg	.33	0.26	0.25	77	76	47-125	2	20	
Triclopyr	mg/kg	.33	0.30	0.30	89	90	68-125	2	20	
2,4-DCAA (S)	%				84	79	46-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 529271 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2872598 Matrix: Solid

Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/30/18 13:11	
n-Triacontane (S)	%.	83	50-150	03/30/18 13:11	

LABORATORY CONTROL SAMPLE & LCSD: 2872599 2872600

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	68.2	73.5	85	92	70-120	8	20	
n-Triacontane (S)	%.				85	78	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 435086 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 2009757 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/04/18 12:49	

LABORATORY CONTROL SAMPLE: 2009758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	981	901	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009842 2009843

Parameter	Units	10424937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1420	1360	ND	ND	0	0	75-125		20	2M, M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009844 2009845

Parameter	Units	10424937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	54.8	54.3	ND	ND	12	18	75-125		20	M3

SAMPLE DUPLICATE: 2009846

Parameter	Units	50193299003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 284583 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

METHOD BLANK: 1665486 Matrix: Solid
 Associated Lab Samples: 10424937001, 10424937002, 10424937003, 10424937004, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	03/29/18 12:56	

LABORATORY CONTROL SAMPLE: 1665487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665488 1665489

Parameter	Units	10424609003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	ND	3.62	3.62	2.8	3.2	66	77	80-120	13	20	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1665490 1665491

Parameter	Units	10424937006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.56	4.11	4.26	4.2	4.0	89	81	80-120	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

QC Batch: 139650 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10424937001, 10424937005, 10424937006

METHOD BLANK: 553027 Matrix: Solid
Associated Lab Samples: 10424937001, 10424937005, 10424937006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/02/18 14:06	

LABORATORY CONTROL SAMPLE: 553026

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50	51.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553028 553029

Parameter	Units	12106345001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/kg	2.6	50.2	49.5	39.2	45.6	73	87	80-120	15	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553030 553031

Parameter	Units	12106346001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/kg	2.9	50.2	49.3	50.6	47.0	95	90	80-120	7	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

QC Batch: 139654 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10424937002, 10424937003, 10424937004

METHOD BLANK: 553043 Matrix: Solid
Associated Lab Samples: 10424937002, 10424937003, 10424937004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.98	03/31/18 00:49	

LABORATORY CONTROL SAMPLE: 553042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	48.9	50.2	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553044 553045

Parameter	Units	10424443004 Result	553044		553045		% Rec	% Rec	% Rec	% Rec	Max		Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					RPD	RPD	
Fluoride	mg/kg	2.9	50.3	50.2	28.2	28.6	50	51	80-120	1	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553046 553047

Parameter	Units	10424937003 Result	553046		553047		% Rec	% Rec	% Rec	% Rec	Max		Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					RPD	RPD	
Fluoride	mg/kg	3.5	49.3	49	14.1	15.9	21	25	80-120	12	20	M1	

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth
PASI-G Pace Analytical Services - Green Bay
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.
2M Redox (174 mv) and pH (8.13) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.
3M Sample was black in color with a tint of red and viscous. After 100X dilution sample was dark orange and was centrifuged and decanted.
4M Sample was black in color. Sample was centrifuged and decanted.
5M Sample was yellow in color.
6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D4 Sample was diluted due to the presence of high levels of target analytes.
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

ANALYTE QUALIFIERS

M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
R1	RPD value was outside control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
T6	High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424937001	FD-SB-G4 (15.5-17.5)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937002	FD-SB-D3 (4-16wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937003	FD-SB-E3 (11-15.5)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937004	FD-SB-F3 (3-11wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937005	FD-SB-G3 (7-16wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937006	FD-SB-G2 (10-12wm)	EPA 1630 (1998)	139779	EPA 1630 (1998)	139780
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3550	529466	EPA 8081B	530402
10424937002	FD-SB-D3 (4-16wm)	EPA 3550	529466	EPA 8081B	530402
10424937003	FD-SB-E3 (11-15.5)	EPA 3550	529466	EPA 8081B	530402
10424937004	FD-SB-F3 (3-11wm)	EPA 3550	529466	EPA 8081B	530402
10424937005	FD-SB-G3 (7-16wm)	EPA 3550	529466	EPA 8081B	530402
10424937006	FD-SB-G2 (10-12wm)	EPA 3550	529466	EPA 8081B	530402
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3550	529467	EPA 8082A	530082
10424937002	FD-SB-D3 (4-16wm)	EPA 3550	529467	EPA 8082A	530082
10424937003	FD-SB-E3 (11-15.5)	EPA 3550	529467	EPA 8082A	530082
10424937004	FD-SB-F3 (3-11wm)	EPA 3550	529467	EPA 8082A	530082
10424937005	FD-SB-G3 (7-16wm)	EPA 3550	529467	EPA 8082A	530082
10424937006	FD-SB-G2 (10-12wm)	EPA 3550	529467	EPA 8082A	530082
10424937001	FD-SB-G4 (15.5-17.5)	WI MOD DRO	529271	WI MOD DRO	529930
10424937002	FD-SB-D3 (4-16wm)	WI MOD DRO	529271	WI MOD DRO	529930
10424937003	FD-SB-E3 (11-15.5)	WI MOD DRO	529271	WI MOD DRO	529930
10424937004	FD-SB-F3 (3-11wm)	WI MOD DRO	529271	WI MOD DRO	529930
10424937005	FD-SB-G3 (7-16wm)	WI MOD DRO	529271	WI MOD DRO	529930
10424937006	FD-SB-G2 (10-12wm)	WI MOD DRO	529271	WI MOD DRO	529930
10424937001	FD-SB-G4 (15.5-17.5)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937002	FD-SB-D3 (4-16wm)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937003	FD-SB-E3 (11-15.5)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937004	FD-SB-F3 (3-11wm)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937005	FD-SB-G3 (7-16wm)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937006	FD-SB-G2 (10-12wm)	EPA 5030 Medium Soil	530309	WI MOD GRO	530384
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3050	529339	EPA 6010C	529383
10424937002	FD-SB-D3 (4-16wm)	EPA 3050	529339	EPA 6010C	529383
10424937003	FD-SB-E3 (11-15.5)	EPA 3050	529339	EPA 6010C	529383
10424937004	FD-SB-F3 (3-11wm)	EPA 3050	529339	EPA 6010C	529383
10424937005	FD-SB-G3 (7-16wm)	EPA 3050	529339	EPA 6010C	529383
10424937006	FD-SB-G2 (10-12wm)	EPA 3050	529339	EPA 6010C	529383
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3050B	434613	EPA 6020	434971
10424937002	FD-SB-D3 (4-16wm)	EPA 3050B	434613	EPA 6020	434971
10424937003	FD-SB-E3 (11-15.5)	EPA 3050B	434613	EPA 6020	434971
10424937004	FD-SB-F3 (3-11wm)	EPA 3050B	434613	EPA 6020	434971
10424937005	FD-SB-G3 (7-16wm)	EPA 3050B	434613	EPA 6020	434971
10424937006	FD-SB-G2 (10-12wm)	EPA 3050B	434613	EPA 6020	434971
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3050	529341	EPA 6020A	529455
10424937002	FD-SB-D3 (4-16wm)	EPA 3050	529341	EPA 6020A	529455
10424937003	FD-SB-E3 (11-15.5)	EPA 3050	529341	EPA 6020A	529455

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soil-Revised Report

Pace Project No.: 10424937

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424937004	FD-SB-F3 (3-11wm)	EPA 3050	529341	EPA 6020A	529455
10424937005	FD-SB-G3 (7-16wm)	EPA 3050	529341	EPA 6020A	529455
10424937006	FD-SB-G2 (10-12wm)	EPA 3050	529341	EPA 6020A	529455
10424937001	FD-SB-G4 (15.5-17.5)	EPA 7471	529342	EPA 7471	529917
10424937002	FD-SB-D3 (4-16wm)	EPA 7471	529342	EPA 7471	529917
10424937003	FD-SB-E3 (11-15.5)	EPA 7471	529342	EPA 7471	529917
10424937004	FD-SB-F3 (3-11wm)	EPA 7471	529342	EPA 7471	529917
10424937005	FD-SB-G3 (7-16wm)	EPA 7471	529342	EPA 7471	529917
10424937006	FD-SB-G2 (10-12wm)	EPA 7471	529342	EPA 7471	529917
10424937001	FD-SB-G4 (15.5-17.5)	ASTM D2974	529398		
10424937002	FD-SB-D3 (4-16wm)	ASTM D2974	529398		
10424937003	FD-SB-E3 (11-15.5)	ASTM D2974	529398		
10424937004	FD-SB-F3 (3-11wm)	ASTM D2974	529398		
10424937005	FD-SB-G3 (7-16wm)	ASTM D2974	529398		
10424937006	FD-SB-G2 (10-12wm)	ASTM D2974	529398		
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3550	529268	EPA 8270D	529887
10424937002	FD-SB-D3 (4-16wm)	EPA 3550	529268	EPA 8270D	529887
10424937003	FD-SB-E3 (11-15.5)	EPA 3550	529268	EPA 8270D	529887
10424937004	FD-SB-F3 (3-11wm)	EPA 3550	529268	EPA 8270D	529887
10424937005	FD-SB-G3 (7-16wm)	EPA 3550	529268	EPA 8270D	529887
10424937006	FD-SB-G2 (10-12wm)	EPA 3550	529268	EPA 8270D	529887
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937002	FD-SB-D3 (4-16wm)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937003	FD-SB-E3 (11-15.5)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937004	FD-SB-F3 (3-11wm)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937005	FD-SB-G3 (7-16wm)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937006	FD-SB-G2 (10-12wm)	EPA 3550	529263	EPA 8270D by SIM	530180
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3546	529569	EPA 8270D	530638
10424937002	FD-SB-D3 (4-16wm)	EPA 3546	529569	EPA 8270D	530638
10424937003	FD-SB-E3 (11-15.5)	EPA 3546	529569	EPA 8270D	530638
10424937004	FD-SB-F3 (3-11wm)	EPA 3546	529569	EPA 8270D	530638
10424937005	FD-SB-G3 (7-16wm)	EPA 3546	530039	EPA 8270D	530639
10424937006	FD-SB-G2 (10-12wm)	EPA 3546	529569	EPA 8270D	530638
10424937001	FD-SB-G4 (15.5-17.5)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937002	FD-SB-D3 (4-16wm)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937003	FD-SB-E3 (11-15.5)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937004	FD-SB-F3 (3-11wm)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937005	FD-SB-G3 (7-16wm)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937006	FD-SB-G2 (10-12wm)	EPA 5035/5030B	529276	EPA 8260B	529485
10424937001	FD-SB-G4 (15.5-17.5)	EPA 3060A	435086	EPA 7196A	435521
10424937002	FD-SB-D3 (4-16wm)	EPA 3060A	435086	EPA 7196A	435521
10424937003	FD-SB-E3 (11-15.5)	EPA 3060A	435086	EPA 7196A	435521
10424937004	FD-SB-F3 (3-11wm)	EPA 3060A	435086	EPA 7196A	435521
10424937005	FD-SB-G3 (7-16wm)	EPA 3060A	435086	EPA 7196A	435521

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Soil-Revised Report
Pace Project No.: 10424937

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424937006	FD-SB-G2 (10-12wm)	EPA 3060A	435086	EPA 7196A	435521
10424937001	FD-SB-G4 (15.5-17.5)	Trivalent Chromium Calculation	436360		
10424937002	FD-SB-D3 (4-16wm)	Trivalent Chromium Calculation	436360		
10424937003	FD-SB-E3 (11-15.5)	Trivalent Chromium Calculation	436360		
10424937004	FD-SB-F3 (3-11wm)	Trivalent Chromium Calculation	436360		
10424937005	FD-SB-G3 (7-16wm)	Trivalent Chromium Calculation	436360		
10424937006	FD-SB-G2 (10-12wm)	Trivalent Chromium Calculation	436360		
10424937001	FD-SB-G4 (15.5-17.5)	EPA 9012A	284583	EPA 9012	284661
10424937002	FD-SB-D3 (4-16wm)	EPA 9012A	284583	EPA 9012	284661
10424937003	FD-SB-E3 (11-15.5)	EPA 9012A	284583	EPA 9012	284661
10424937004	FD-SB-F3 (3-11wm)	EPA 9012A	284583	EPA 9012	284661
10424937005	FD-SB-G3 (7-16wm)	EPA 9012A	284583	EPA 9012	284661
10424937006	FD-SB-G2 (10-12wm)	EPA 9012A	284583	EPA 9012	284661
10424937001	FD-SB-G4 (15.5-17.5)	EPA 300.0	139650	EPA 9056A	139673
10424937002	FD-SB-D3 (4-16wm)	EPA 300.0	139654	EPA 9056A	139672
10424937003	FD-SB-E3 (11-15.5)	EPA 300.0	139654	EPA 9056A	139672
10424937004	FD-SB-F3 (3-11wm)	EPA 300.0	139654	EPA 9056A	139672
10424937005	FD-SB-G3 (7-16wm)	EPA 300.0	139650	EPA 9056A	139673
10424937006	FD-SB-G2 (10-12wm)	EPA 300.0	139650	EPA 9056A	139673

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WO#: 10424937



Minnesota Pollution Control Agency

Chain-of-Custody Form revised 201 1/2009

Work Order Number: COC

Turnaround Time: COC

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: *MPCA - Freeway LF Solids* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA - Freeway LF Solids* Project Task Code:

Address: *18-00383*

Project Manager:

EPIC Profile #38716

Potential Hazard? If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water AR=Air
NW=Non-potable Water BL=Biological Material
SD=Soil/Solid OT=Other
WP=Wipe TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
Wt-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	Lab Sample No.	#
<i>FD-SB-64 (15.5-17.0)</i>	<i>S</i>	<i>3/26/18</i>	<i>1150</i>	<i>15.5</i>	<i>17.0</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>001</i>	<i>1</i>
<i>FD-SB-D3 (4-16WM)</i>	<i>S</i>	<i>3/26/18</i>	<i>1400</i>	<i>4</i>	<i>16</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>002</i>	<i>2</i>
<i>FD-SB-E3 (11-15)</i>	<i>S</i>	<i>3/26/18</i>	<i>1440</i>	<i>11</i>	<i>15</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>003</i>	<i>3</i>
<i>FD-SB-F3 (3-11WM)</i>	<i>S</i>	<i>3/26/18</i>	<i>1530</i>	<i>3</i>	<i>11</i>	<i>C</i>	<i>SD</i>				<i>12</i>			<i>004</i>	<i>4</i>
<i>FD-SB-G3 (7-16WM)</i>	<i>S</i>	<i>3/26/18</i>	<i>1635</i>	<i>7</i>	<i>16</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>005</i>	<i>5</i>
<i>FD-SB-G2 (10-12WM)</i>	<i>S</i>	<i>3/26/18</i>	<i>1720</i>	<i>10</i>	<i>12</i>	<i>C</i>	<i>SD</i>				<i>13</i>			<i>006</i>	<i>6</i>
															<i>7</i>
															<i>8</i>
															<i>9</i>
															<i>10</i>

Sampled By: *David Anderson*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / Pace Analytical</i>	<i>3/27/18/0700</i>	<i>WJ Pace</i>	<i>3-27-18 815 4.7°C</i>

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO# : 10424937
 PM: BM2 Due Date: 04/10/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 4.5 Cooler Temp Corrected (°C): 4.7 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 3/27/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No fine on samples</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # _____ Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: BA N Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424937 Workorder Name: 18-00383 MPCA Freeway LF Soil Owner Received Date: 3/27/2018 Results Requested By: 4/10/2018

Report To		Subcontract To				Requested Analysis																						
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380																										
						Preserved Containers					Methyl Mercury by EPA 1630					LAB USE ONLY												
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																						
1	FD-SB-G4 (15.5-17.5)	PS	3/26/2018 11:30	10424937001	Solid	1																						
2	FD-SB-D3 (4-16wm)	PS	3/26/2018 14:00	10424937002	Solid	1																						
3	FD-SB-E3 (11-15.5)	PS	3/26/2018 14:40	10424937003	Solid	1																						
4	FD-SB-F3 (3-11wm)	PS	3/26/2018 15:30	10424937004	Solid	1																						
5	FD-SB-G3 (7-16wm)	PS	3/26/2018 16:35	10424937005	Solid	1																						
6	FD-SB-G2 (10-12wm)	PS	3/26/2018 17:20	10424937006	Solid	1																						

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	3/27/18 1736	<i>[Signature]</i>	3/27/18 1845-						
<i>[Signature]</i>	3/27/18 2100	<i>[Signature]</i>	3/28/18 0800						

Cooler Temperature on Receipt 2.9 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-DUL-C-001-rev.05

Document Revised: 7Mar2018
Page 1 of 1
Issuing Authority:
Pace Duluth Minnesota Quality Office

**Sample Condition
Upon Receipt**

Client Name:

Project #:

Pace-Mpls

WO# : 12106363
PM: HRZ **Due Date: 04/10/18**
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.7 Cooler Temp Corrected °C: 2.7 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.09 Date and Initials of Person Examining Contents: 3/27/18 CC

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: *Heather*

Date: 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: Pace - Mpls. Project #: _____

WO#: 12106363
 PM: HRZ Due Date: 04/10/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 3/27/18 CAS

Comments: all 5/28/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SC</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____


FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

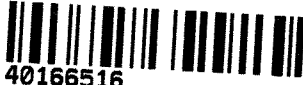
Date: 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN Project #: _____
Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

WO#: 40166516

 40166516

Tracking #: 1676708
Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used: SR - 4 **Type of Ice:** Wet Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature: Uncorr: 5.5 ICorr: 5

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no
 Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Person examining contents:
 Date: 3-28-18
 Initials: SW

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>FRWD</u> 3-28-18 SW
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>Original client labels</u> <u>no collect times.</u> 3-28-18 SW
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: CEV **Date:** 3/28/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193167

Date/Time and Initials of person examining contents: 3/28/18 1415 AX

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7405

Custody Seal on Cooler/Box Present: Yes No

Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 023456 ABCDEF **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 0.8/1.0 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)			All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:			Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:			Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)?: Analysis:			Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			
Rush TAT Requested:			Headspace in VOA Vials (>6mm):			
Containers Intact?:			Trip Blank Present?:			
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:			

Comments:

May 03, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 27, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on May 3, 2018 to exlude results for magnesium and include results for manganese by method 6010.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10425111001	FD-SB-A2 (10-20 S)	Solid	03/27/18 10:40	03/27/18 16:50
10425111002	FD-SB-B2 (12-21 WM)	Solid	03/27/18 11:15	03/27/18 16:50
10425111003	FD-SB-C2 (5-17 WM)	Solid	03/27/18 13:30	03/27/18 16:50
10425111004	FD-SB-D2 (3-12 WM)	Solid	03/27/18 14:10	03/27/18 16:50
10425111005	FD-SB-E2 (11-21 S)	Solid	03/27/18 15:15	03/27/18 16:50
10425111006	FD-SB-F2 (7-13 WM)	Solid	03/27/18 16:20	03/27/18 16:50

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10425111001	FD-SB-A2 (10-20 S)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8270D	STB	12	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10425111002	FD-SB-B2 (12-21 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8270D	STB			12	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10425111003	FD-SB-C2 (5-17 WM)			EPA 1630 (1998)	CPK	1	PASI-DUL

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10425111004	FD-SB-D2 (3-12 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10425111005	FD-SB-E2 (11-21 S)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10425111006	FD-SB-F2 (7-13 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8270D	STB	12	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.0	1	04/04/18 10:58	04/06/18 14:18	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	309-00-2	
alpha-BHC	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	319-84-6	
beta-BHC	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	319-85-7	
delta-BHC	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	58-89-9	
Chlordane (Technical)	ND	ug/kg	2300	100	03/28/18 12:51	04/05/18 23:25	57-74-9	
alpha-Chlordane	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	5103-71-9	
gamma-Chlordane	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	5103-74-2	
4,4'-DDD	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	72-54-8	
4,4'-DDE	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	72-55-9	
4,4'-DDT	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	50-29-3	
Dieldrin	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	60-57-1	
Endosulfan I	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	959-98-8	
Endosulfan II	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	33213-65-9	
Endosulfan sulfate	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	1031-07-8	
Endrin	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	72-20-8	
Endrin aldehyde	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	7421-93-4	
Endrin ketone	ND	ug/kg	458	100	03/28/18 12:51	04/05/18 23:25	53494-70-5	
Heptachlor	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	76-44-8	
Heptachlor epoxide	ND	ug/kg	230	100	03/28/18 12:51	04/05/18 23:25	1024-57-3	
Methoxychlor	ND	ug/kg	2300	100	03/28/18 12:51	04/05/18 23:25	72-43-5	
Toxaphene	ND	ug/kg	6870	100	03/28/18 12:51	04/05/18 23:25	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	100	03/28/18 12:51	04/05/18 23:25	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	100	03/28/18 12:51	04/05/18 23:25	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11141-16-5	
PCB-1242 (Aroclor 1242)	122	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	11100-14-4	
PCB, Total	122	ug/kg	44.9	1	03/28/18 12:51	04/02/18 11:30	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	74	%	48-125	1	03/28/18 12:51	04/02/18 11:30	877-09-8	
Decachlorobiphenyl (S)	83	%	30-134	1	03/28/18 12:51	04/02/18 11:30	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	11.5	1	03/28/18 12:37	03/29/18 12:07		
Surrogates								
n-Triacontane (S)	57	%	50-150	1	03/28/18 12:37	03/29/18 12:07	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.0	1	04/03/18 15:49	04/03/18 21:58		
Surrogates								
a,a,a-Trifluorotoluene (S)	100	%	80-150	1	04/03/18 15:49	04/03/18 21:58	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	11500	mg/kg	13.2	1	03/30/18 05:23	04/02/18 11:41	7429-90-5	
Barium	130	mg/kg	0.66	1	03/30/18 05:23	04/02/18 11:41	7440-39-3	
Boron	238	mg/kg	9.9	1	03/30/18 05:23	04/02/18 11:41	7440-42-8	
Copper	26.1	mg/kg	0.66	1	03/30/18 05:23	04/02/18 11:41	7440-50-8	
Iron	35100	mg/kg	16.5	5	03/30/18 05:23	04/02/18 12:48	7439-89-6	
Manganese	161	mg/kg	0.33	1	03/30/18 05:23	04/02/18 11:41	7439-96-5	
Nickel	26.9	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:41	7440-02-0	
Silver	ND	mg/kg	0.66	1	03/30/18 05:23	04/02/18 11:41	7440-22-4	
Tin	ND	mg/kg	5.0	1	03/30/18 05:23	04/02/18 11:41	7440-31-5	
Titanium	568	mg/kg	1.7	1	03/30/18 05:23	04/02/18 11:41	7440-32-6	
Zinc	173	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:41	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	49.9	mg/kg	1.3	5	04/04/18 17:21	04/08/18 14:43	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	2.0	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7440-36-0	M6
Arsenic	23.3	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7440-38-2	
Beryllium	3.1	mg/kg	0.26	20	03/30/18 05:24	03/30/18 11:01	7440-41-7	
Cadmium	2.3	mg/kg	0.11	20	03/30/18 05:24	03/30/18 11:01	7440-43-9	
Cobalt	8.3	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7440-48-4	
Lead	37.7	mg/kg	0.13	20	03/30/18 05:24	03/30/18 11:01	7439-92-1	
Lithium	14.9	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7439-93-2	
Selenium	5.4	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7782-49-2	
Strontium	77.3	mg/kg	0.66	20	03/30/18 05:24	03/30/18 11:01	7440-24-6	
Vanadium	124	mg/kg	1.3	20	03/30/18 05:24	03/30/18 11:01	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.070	mg/kg	0.028	1	03/30/18 05:24	04/04/18 17:39	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	27.3	%	0.10	1		03/29/18 13:23		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	2320	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-A2 (10-20 S)** Lab ID: **10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	208-96-8	
Anthracene	8100	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	120-12-7	
Benzo(a)anthracene	10800	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	56-55-3	
Benzo(a)pyrene	8910	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	50-32-8	
Benzo(b)fluoranthene	11200	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	205-99-2	
Benzo(g,h,i)perylene	3930	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	191-24-2	
Benzo(k)fluoranthene	4830	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	101-55-3	
Butylbenzylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	85-68-7	
Carbazole	2950	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	59-50-7	
4-Chloroaniline	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	108-60-1	
2-Chloronaphthalene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	91-58-7	
2-Chlorophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	7005-72-3	
Chrysene	11200	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	218-01-9	
Dibenz(a,h)anthracene	990	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	53-70-3	
Dibenzofuran	1590	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	120-83-2	
Diethylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	105-67-9	
Dimethylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	131-11-3	
Di-n-butylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2330	1	03/29/18 13:52	04/05/18 15:37	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	606-20-2	
Di-n-octylphthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	117-81-7	
Fluoranthene	27300	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	206-44-0	
Fluorene	3150	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	87-68-3	
Hexachlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	118-74-1	
Hexachloroethane	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	67-72-1	
Indeno(1,2,3-cd)pyrene	3610	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	193-39-5	
Isophorone	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	78-59-1	
1-Methylnaphthalene	539	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	90-12-0	
2-Methylnaphthalene	523	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	904	1	03/29/18 13:52	04/05/18 15:37		
Naphthalene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	91-20-3	
2-Nitroaniline	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	88-74-4	
3-Nitroaniline	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	99-09-2	
4-Nitroaniline	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	100-01-6	
Nitrobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	98-95-3	
2-Nitrophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	88-75-5	
4-Nitrophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	86-30-6	
Pentachlorophenol	ND	ug/kg	918	1	03/29/18 13:52	04/05/18 15:37	87-86-5	
Phenanthrene	23700	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	85-01-8	
Phenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	108-95-2	
Pyrene	23000	ug/kg	2260	5	03/29/18 13:52	04/08/18 18:08	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	452	1	03/29/18 13:52	04/05/18 15:37	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	54	%	43-125	1	03/29/18 13:52	04/05/18 15:37	4165-60-0	D4
2-Fluorobiphenyl (S)	66	%	30-132	1	03/29/18 13:52	04/05/18 15:37	321-60-8	
p-Terphenyl-d14 (S)	77	%	62-125	1	03/29/18 13:52	04/05/18 15:37	1718-51-0	
Phenol-d6 (S)	63	%	48-125	1	03/29/18 13:52	04/05/18 15:37	13127-88-3	
2-Fluorophenol (S)	60	%	40-125	1	03/29/18 13:52	04/05/18 15:37	367-12-4	
2,4,6-Tribromophenol (S)	69	%	60-125	1	03/29/18 13:52	04/05/18 15:37	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	3930	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	83-32-9	
Acenaphthylene	204	ug/kg	68.7	5	03/28/18 19:00	03/30/18 20:56	208-96-8	
Anthracene	11300	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	120-12-7	
Benzo(a)anthracene	14400	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	56-55-3	
Benzo(a)pyrene	11700	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	50-32-8	
Benzo(b)fluoranthene	13300	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	205-99-2	
Benzo(g,h,i)perylene	5310	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	191-24-2	
Benzo(k)fluoranthene	6960	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	207-08-9	
Chrysene	13900	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	218-01-9	
Dibenz(a,h)anthracene	1700	ug/kg	68.7	5	03/28/18 19:00	03/30/18 20:56	53-70-3	
Fluoranthene	40000	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	206-44-0	
Fluorene	4970	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	86-73-7	
Indeno(1,2,3-cd)pyrene	4480	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	193-39-5	
Naphthalene	644	ug/kg	68.7	5	03/28/18 19:00	03/30/18 20:56	91-20-3	
Phenanthrene	30900	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	85-01-8	
Pyrene	32500	ug/kg	1370	100	03/28/18 19:00	04/02/18 14:04	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	52	%	42-125	5	03/28/18 19:00	03/30/18 20:56	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-A2 (10-20 S)** Lab ID: **10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
p-Terphenyl-d14 (S)	64	%.	57-125	5	03/28/18 19:00	03/30/18 20:56	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	25057-89-0	
2,4-D	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	94-75-7	
2,4-DB	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	94-82-6	
Dicamba	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	1918-00-9	
Dinoseb	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	88-85-7	
MCPA	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	94-74-6	
Pentachlorophenol	0.30	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	87-86-5	
Picloram	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	1918-02-1	
2,4,5-T	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	93-72-1	
Triclopyr	ND	mg/kg	0.23	5	03/29/18 07:30	04/04/18 18:58	55335-06-3	
Surrogates								
2,4-DCAA (S)	69	%.	46-125	5	03/29/18 07:30	04/04/18 18:58	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1350	1	03/28/18 15:25	03/29/18 11:41	67-64-1	
Allyl chloride	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	107-05-1	
Benzene	ND	ug/kg	27.1	1	03/28/18 15:25	03/29/18 11:41	71-43-2	
Bromobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	108-86-1	
Bromochloromethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	74-97-5	
Bromodichloromethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	75-27-4	
Bromoform	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	75-25-2	
Bromomethane	ND	ug/kg	677	1	03/28/18 15:25	03/29/18 11:41	74-83-9	
2-Butanone (MEK)	ND	ug/kg	339	1	03/28/18 15:25	03/29/18 11:41	78-93-3	
n-Butylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	135-98-8	
tert-Butylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	98-06-6	
Carbon tetrachloride	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	56-23-5	
Chlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	108-90-7	
Chloroethane	ND	ug/kg	677	1	03/28/18 15:25	03/29/18 11:41	75-00-3	
Chloroform	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	67-66-3	
Chloromethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	95-49-8	
4-Chlorotoluene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	677	1	03/28/18 15:25	03/29/18 11:41	96-12-8	
Dibromochloromethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	106-93-4	
Dibromomethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	75-71-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1-Dichloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	107-06-2	
1,1-Dichloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	156-60-5	
Dichlorofluoromethane	ND	ug/kg	677	1	03/28/18 15:25	03/29/18 11:41	75-43-4	
1,2-Dichloropropane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	142-28-9	
2,2-Dichloropropane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	594-20-7	
1,1-Dichloropropene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	60-29-7	
Ethylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	339	1	03/28/18 15:25	03/29/18 11:41	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	98-82-8	
p-Isopropyltoluene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	99-87-6	
Methylene Chloride	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	339	1	03/28/18 15:25	03/29/18 11:41	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	1634-04-4	
Naphthalene	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	91-20-3	
n-Propylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	103-65-1	
Styrene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	79-34-5	N2
Tetrachloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	127-18-4	
Tetrahydrofuran	ND	ug/kg	2710	1	03/28/18 15:25	03/29/18 11:41	109-99-9	
Toluene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	79-00-5	
Trichloroethene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	271	1	03/28/18 15:25	03/29/18 11:41	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	67.7	1	03/28/18 15:25	03/29/18 11:41	108-67-8	
Vinyl chloride	ND	ug/kg	27.1	1	03/28/18 15:25	03/29/18 11:41	75-01-4	
Xylene (Total)	ND	ug/kg	203	1	03/28/18 15:25	03/29/18 11:41	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%	75-125	1	03/28/18 15:25	03/29/18 11:41	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	03/28/18 15:25	03/29/18 11:41	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	03/28/18 15:25	03/29/18 11:41	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-A2 (10-20 S) **Lab ID: 10425111001** Collected: 03/27/18 10:40 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	13.5	5	04/02/18 15:00	04/04/18 13:19	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	49.9	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	0.41	1	04/05/18 10:35	04/05/18 14:31	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	2.3	mg/kg	1.0	1	04/02/18 15:30	04/03/18 16:03	16984-48-8	M1,R1

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.9	1	04/04/18 10:58	04/06/18 14:38	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	309-00-2	
alpha-BHC	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	319-84-6	
beta-BHC	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	319-85-7	
delta-BHC	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	58-89-9	
Chlordane (Technical)	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	57-74-9	
alpha-Chlordane	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	5103-71-9	
gamma-Chlordane	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	5103-74-2	
4,4'-DDD	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	72-54-8	
4,4'-DDE	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	72-55-9	
4,4'-DDT	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	50-29-3	
Dieldrin	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	60-57-1	
Endosulfan I	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	959-98-8	
Endosulfan II	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	33213-65-9	
Endosulfan sulfate	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	1031-07-8	
Endrin	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	72-20-8	
Endrin aldehyde	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	7421-93-4	
Endrin ketone	ND	ug/kg	24.1	5	03/28/18 12:51	04/05/18 21:54	53494-70-5	
Heptachlor	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	76-44-8	
Heptachlor epoxide	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	1024-57-3	
Methoxychlor	ND	ug/kg	12.1	5	03/28/18 12:51	04/05/18 21:54	72-43-5	
Toxaphene	ND	ug/kg	362	5	03/28/18 12:51	04/05/18 21:54	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	78	%	30-150	5	03/28/18 12:51	04/05/18 21:54	877-09-8	5M,D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	117	%.	30-150	5	03/28/18 12:51	04/05/18 21:54	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	11100-14-4	
PCB, Total	ND	ug/kg	47.7	1	03/28/18 12:51	04/02/18 11:46	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%.	48-125	1	03/28/18 12:51	04/02/18 11:46	877-09-8	
Decachlorobiphenyl (S)	77	%.	30-134	1	03/28/18 12:51	04/02/18 11:46	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	139	mg/kg	60.0	5	03/28/18 18:58	03/29/18 16:50		T6
Surrogates								
n-Triacontane (S)	76	%.	50-150	5	03/28/18 18:58	03/29/18 16:50	638-68-6	
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	16.7	1	04/03/18 15:49	04/03/18 22:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/03/18 15:49	04/03/18 22:21	98-08-8	
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8890	mg/kg	13.9	1	03/30/18 05:23	04/02/18 11:45	7429-90-5	
Barium	129	mg/kg	0.70	1	03/30/18 05:23	04/02/18 11:45	7440-39-3	
Boron	196	mg/kg	10.5	1	03/30/18 05:23	04/02/18 11:45	7440-42-8	
Copper	20.7	mg/kg	0.70	1	03/30/18 05:23	04/02/18 11:45	7440-50-8	
Iron	27900	mg/kg	17.4	5	03/30/18 05:23	04/02/18 12:52	7439-89-6	
Manganese	250	mg/kg	0.35	1	03/30/18 05:23	04/02/18 11:45	7439-96-5	
Nickel	30.9	mg/kg	1.4	1	03/30/18 05:23	04/02/18 11:45	7440-02-0	
Silver	ND	mg/kg	0.70	1	03/30/18 05:23	04/02/18 11:45	7440-22-4	
Tin	ND	mg/kg	5.2	1	03/30/18 05:23	04/02/18 11:45	7440-31-5	
Titanium	426	mg/kg	1.7	1	03/30/18 05:23	04/02/18 11:45	7440-32-6	
Zinc	1050	mg/kg	1.4	1	03/30/18 05:23	04/02/18 11:45	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	46.8	mg/kg	1.3	5	04/04/18 17:21	04/08/18 14:47	7440-47-3	N2

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) Lab ID: 10425111002 Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	1.9	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7440-36-0	
Arsenic	14.8	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7440-38-2	
Beryllium	2.3	mg/kg	0.27	20	03/30/18 05:24	03/30/18 10:47	7440-41-7	
Cadmium	3.8	mg/kg	0.11	20	03/30/18 05:24	03/30/18 10:47	7440-43-9	
Cobalt	6.8	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7440-48-4	
Lead	56.8	mg/kg	0.14	20	03/30/18 05:24	03/30/18 10:47	7439-92-1	
Lithium	12.1	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7439-93-2	
Selenium	3.9	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7782-49-2	
Strontium	63.2	mg/kg	0.68	20	03/30/18 05:24	03/30/18 10:47	7440-24-6	
Vanadium	135	mg/kg	1.4	20	03/30/18 05:24	03/30/18 10:47	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.056	mg/kg	0.026	1	03/30/18 05:24	04/04/18 17:45	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	31.0	%	0.10	1		03/29/18 13:23		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	83-32-9	
Acenaphthylene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	208-96-8	
Anthracene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	120-12-7	
Benzo(a)anthracene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	56-55-3	
Benzo(a)pyrene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	101-55-3	
Butylbenzylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	85-68-7	
Carbazole	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	59-50-7	
4-Chloroaniline	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	108-60-1	
2-Chloronaphthalene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	91-58-7	
2-Chlorophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	7005-72-3	
Chrysene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	53-70-3	
Dibenzofuran	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	120-83-2	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Diethylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	105-67-9	
Dimethylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	131-11-3	
Di-n-butylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2450	1	03/29/18 13:52	04/05/18 16:06	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	606-20-2	
Di-n-octylphthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	117-81-7	
Fluoranthene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	206-44-0	
Fluorene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	87-68-3	
Hexachlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	118-74-1	
Hexachloroethane	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	193-39-5	
Isophorone	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	78-59-1	
1-Methylnaphthalene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	90-12-0	
2-Methylnaphthalene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	951	1	03/29/18 13:52	04/05/18 16:06		
Naphthalene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	91-20-3	
2-Nitroaniline	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	88-74-4	
3-Nitroaniline	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	99-09-2	
4-Nitroaniline	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	100-01-6	
Nitrobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	98-95-3	
2-Nitrophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	88-75-5	
4-Nitrophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	86-30-6	
Pentachlorophenol	ND	ug/kg	965	1	03/29/18 13:52	04/05/18 16:06	87-86-5	
Phenanthrene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	85-01-8	
Phenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	108-95-2	
Pyrene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	475	1	03/29/18 13:52	04/05/18 16:06	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	52	%	43-125	1	03/29/18 13:52	04/05/18 16:06	4165-60-0	
2-Fluorobiphenyl (S)	66	%	30-132	1	03/29/18 13:52	04/05/18 16:06	321-60-8	
p-Terphenyl-d14 (S)	87	%	62-125	1	03/29/18 13:52	04/05/18 16:06	1718-51-0	
Phenol-d6 (S)	65	%	48-125	1	03/29/18 13:52	04/05/18 16:06	13127-88-3	
2-Fluorophenol (S)	60	%	40-125	1	03/29/18 13:52	04/05/18 16:06	367-12-4	
2,4,6-Tribromophenol (S)	76	%	60-125	1	03/29/18 13:52	04/05/18 16:06	118-79-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	339	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	83-32-9	
Acenaphthylene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	208-96-8	
Anthracene	106	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	120-12-7	
Benzo(a)anthracene	82.8	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	56-55-3	
Benzo(a)pyrene	83.3	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	50-32-8	
Benzo(b)fluoranthene	104	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	207-08-9	
Chrysene	94.4	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	53-70-3	
Fluoranthene	242	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	206-44-0	
Fluorene	331	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	193-39-5	
Naphthalene	ND	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	91-20-3	
Phenanthrene	219	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	85-01-8	
Pyrene	225	ug/kg	72.5	5	03/28/18 19:00	03/30/18 21:18	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	67	%.	42-125	5	03/28/18 19:00	03/30/18 21:18	321-60-8	D3
p-Terphenyl-d14 (S)	78	%.	57-125	5	03/28/18 19:00	03/30/18 21:18	1718-51-0	
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	25057-89-0	
2,4-D	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	94-75-7	
2,4-DB	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	94-82-6	
Dicamba	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	1918-00-9	
Dinoseb	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	88-85-7	
MCPA	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	94-74-6	
Pentachlorophenol	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	87-86-5	
Picloram	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	1918-02-1	
2,4,5-T	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	93-72-1	
Triclopyr	ND	mg/kg	0.047	1	03/29/18 07:30	04/04/18 17:30	55335-06-3	
Surrogates								
2,4-DCAA (S)	68	%.	46-125	1	03/29/18 07:30	04/04/18 17:30	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1440	1	03/28/18 15:25	03/29/18 12:31	67-64-1	
Allyl chloride	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	107-05-1	
Benzene	ND	ug/kg	28.9	1	03/28/18 15:25	03/29/18 12:31	71-43-2	
Bromobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	108-86-1	
Bromochloromethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	74-97-5	
Bromodichloromethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	75-27-4	
Bromoform	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	75-25-2	
Bromomethane	ND	ug/kg	722	1	03/28/18 15:25	03/29/18 12:31	74-83-9	
2-Butanone (MEK)	ND	ug/kg	361	1	03/28/18 15:25	03/29/18 12:31	78-93-3	
n-Butylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
sec-Butylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	135-98-8	
tert-Butylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	98-06-6	
Carbon tetrachloride	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	56-23-5	
Chlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	108-90-7	
Chloroethane	ND	ug/kg	722	1	03/28/18 15:25	03/29/18 12:31	75-00-3	
Chloroform	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	67-66-3	
Chloromethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	74-87-3	
2-Chlorotoluene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	95-49-8	
4-Chlorotoluene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	722	1	03/28/18 15:25	03/29/18 12:31	96-12-8	
Dibromochloromethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	106-93-4	
Dibromomethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	75-71-8	
1,1-Dichloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	75-34-3	
1,2-Dichloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	107-06-2	
1,1-Dichloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	156-60-5	
Dichlorofluoromethane	ND	ug/kg	722	1	03/28/18 15:25	03/29/18 12:31	75-43-4	
1,2-Dichloropropane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	78-87-5	
1,3-Dichloropropane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	142-28-9	
2,2-Dichloropropane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	594-20-7	
1,1-Dichloropropene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	60-29-7	
Ethylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	361	1	03/28/18 15:25	03/29/18 12:31	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	98-82-8	
p-Isopropyltoluene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	99-87-6	
Methylene Chloride	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	361	1	03/28/18 15:25	03/29/18 12:31	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	1634-04-4	
Naphthalene	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	91-20-3	
n-Propylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	103-65-1	
Styrene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	79-34-5	N2
Tetrachloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	127-18-4	
Tetrahydrofuran	ND	ug/kg	2890	1	03/28/18 15:25	03/29/18 12:31	109-99-9	
Toluene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-B2 (12-21 WM) **Lab ID: 10425111002** Collected: 03/27/18 11:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,4-Trichlorobenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	79-00-5	
Trichloroethene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	289	1	03/28/18 15:25	03/29/18 12:31	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	72.2	1	03/28/18 15:25	03/29/18 12:31	108-67-8	
Vinyl chloride	ND	ug/kg	28.9	1	03/28/18 15:25	03/29/18 12:31	75-01-4	
Xylene (Total)	ND	ug/kg	216	1	03/28/18 15:25	03/29/18 12:31	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	75-125	1	03/28/18 15:25	03/29/18 12:31	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/28/18 15:25	03/29/18 12:31	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	03/28/18 15:25	03/29/18 12:31	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.2	5	04/02/18 15:00	04/04/18 13:19	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	46.8	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.62	1	04/05/18 10:35	04/05/18 14:34	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	3.3	mg/kg	0.98	1	04/02/18 15:30	04/03/18 17:02	16984-48-8	

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	8.93	1	04/04/18 10:58	04/06/18 14:45	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	309-00-2	
alpha-BHC	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	319-84-6	
beta-BHC	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	319-85-7	
delta-BHC	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	58-89-9	
Chlordane (Technical)	ND	ug/kg	1080	50	03/28/18 12:51	04/05/18 23:43	57-74-9	
alpha-Chlordane	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
gamma-Chlordane	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	5103-74-2	
4,4'-DDD	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	72-54-8	
4,4'-DDE	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	72-55-9	
4,4'-DDT	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	50-29-3	
Dieldrin	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	60-57-1	
Endosulfan I	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	959-98-8	
Endosulfan II	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	33213-65-9	
Endosulfan sulfate	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	1031-07-8	
Endrin	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	72-20-8	
Endrin aldehyde	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	7421-93-4	
Endrin ketone	ND	ug/kg	216	50	03/28/18 12:51	04/05/18 23:43	53494-70-5	
Heptachlor	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	76-44-8	
Heptachlor epoxide	ND	ug/kg	108	50	03/28/18 12:51	04/05/18 23:43	1024-57-3	
Methoxychlor	ND	ug/kg	1080	50	03/28/18 12:51	04/05/18 23:43	72-43-5	
Toxaphene	ND	ug/kg	3240	50	03/28/18 12:51	04/05/18 23:43	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	03/28/18 12:51	04/05/18 23:43	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	50	03/28/18 12:51	04/05/18 23:43	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	12672-29-6	
PCB-1254 (Aroclor 1254)	178	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	11100-14-4	
PCB, Total	178	ug/kg	42.8	1	03/28/18 12:51	04/02/18 14:24	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	76	%	48-125	1	03/28/18 12:51	04/02/18 14:24	877-09-8	
Decachlorobiphenyl (S)	91	%	30-134	1	03/28/18 12:51	04/02/18 14:24	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	413	mg/kg	223	20	03/28/18 18:58	03/29/18 13:32		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	20	03/28/18 18:58	03/29/18 13:32	638-68-6	S4
WIGRO GCV								
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	75.7	mg/kg	15.6	1	04/03/18 15:49	04/03/18 22:45		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/03/18 15:49	04/03/18 22:45	98-08-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4660	mg/kg	13.0	1	03/30/18 05:23	04/02/18 11:49	7429-90-5	
Barium	198	mg/kg	0.65	1	03/30/18 05:23	04/02/18 11:49	7440-39-3	
Boron	85.7	mg/kg	9.7	1	03/30/18 05:23	04/02/18 11:49	7440-42-8	
Copper	53.4	mg/kg	0.65	1	03/30/18 05:23	04/02/18 11:49	7440-50-8	
Iron	66500	mg/kg	32.5	10	03/30/18 05:23	04/02/18 12:56	7439-89-6	
Manganese	520	mg/kg	0.32	1	03/30/18 05:23	04/02/18 11:49	7439-96-5	
Nickel	23.8	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:49	7440-02-0	
Silver	ND	mg/kg	0.65	1	03/30/18 05:23	04/02/18 11:49	7440-22-4	
Tin	793	mg/kg	4.9	1	03/30/18 05:23	04/02/18 11:49	7440-31-5	
Titanium	248	mg/kg	1.6	1	03/30/18 05:23	04/02/18 11:49	7440-32-6	
Zinc	237	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:49	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	51.1	mg/kg	1.2	5	04/04/18 17:21	04/08/18 14:52	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.7	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7440-36-0	
Arsenic	15.9	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7440-38-2	
Beryllium	0.81	mg/kg	0.26	20	03/30/18 05:24	03/30/18 10:50	7440-41-7	
Cadmium	2.2	mg/kg	0.10	20	03/30/18 05:24	03/30/18 10:50	7440-43-9	
Cobalt	7.1	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7440-48-4	
Lead	557	mg/kg	0.13	20	03/30/18 05:24	03/30/18 10:50	7439-92-1	
Lithium	7.7	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7439-93-2	
Selenium	1.3	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7782-49-2	
Strontium	59.1	mg/kg	0.64	20	03/30/18 05:24	03/30/18 10:50	7440-24-6	
Vanadium	54.5	mg/kg	1.3	20	03/30/18 05:24	03/30/18 10:50	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.38	mg/kg	0.026	1	03/30/18 05:24	04/04/18 17:47	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	23.0	%	0.10	1		03/29/18 13:23		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	466	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	83-32-9	
Acenaphthylene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	208-96-8	
Anthracene	1440	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	120-12-7	
Benzo(a)anthracene	3590	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	56-55-3	
Benzo(a)pyrene	2710	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	50-32-8	
Benzo(b)fluoranthene	3760	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	205-99-2	
Benzo(g,h,i)perylene	1380	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	191-24-2	
Benzo(k)fluoranthene	1270	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	101-55-3	
Butylbenzylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	85-68-7	
Carbazole	529	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
4-Chloro-3-methylphenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	59-50-7	
4-Chloroaniline	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	108-60-1	
2-Chloronaphthalene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	91-58-7	
2-Chlorophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	7005-72-3	
Chrysene	3290	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	53-70-3	
Dibenzofuran	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	120-83-2	
Diethylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	105-67-9	
Dimethylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	131-11-3	
Di-n-butylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2210	1	03/29/18 13:52	04/05/18 16:36	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	606-20-2	
Di-n-octylphthalate	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	122-66-7	
bis(2-Ethylhexyl)phthalate	1220	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	117-81-7	
Fluoranthene	7680	ug/kg	857	2	03/29/18 13:52	04/08/18 18:37	206-44-0	
Fluorene	723	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	87-68-3	
Hexachlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	118-74-1	
Hexachloroethane	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	67-72-1	
Indeno(1,2,3-cd)pyrene	1210	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	193-39-5	
Isophorone	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	78-59-1	
1-Methylnaphthalene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	857	1	03/29/18 13:52	04/05/18 16:36		
Naphthalene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	91-20-3	
2-Nitroaniline	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	88-74-4	
3-Nitroaniline	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	99-09-2	
4-Nitroaniline	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	100-01-6	
Nitrobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	98-95-3	
2-Nitrophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	88-75-5	
4-Nitrophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

N-Nitroso-di-n-propylamine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	86-30-6	
Pentachlorophenol	ND	ug/kg	870	1	03/29/18 13:52	04/05/18 16:36	87-86-5	
Phenanthrene	6640	ug/kg	857	2	03/29/18 13:52	04/08/18 18:37	85-01-8	
Phenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	108-95-2	
Pyrene	6760	ug/kg	857	2	03/29/18 13:52	04/08/18 18:37	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	428	1	03/29/18 13:52	04/05/18 16:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	50	%	43-125	1	03/29/18 13:52	04/05/18 16:36	4165-60-0	
2-Fluorobiphenyl (S)	61	%	30-132	1	03/29/18 13:52	04/05/18 16:36	321-60-8	
p-Terphenyl-d14 (S)	78	%	62-125	1	03/29/18 13:52	04/05/18 16:36	1718-51-0	
Phenol-d6 (S)	60	%	48-125	1	03/29/18 13:52	04/05/18 16:36	13127-88-3	
2-Fluorophenol (S)	57	%	40-125	1	03/29/18 13:52	04/05/18 16:36	367-12-4	
2,4,6-Tribromophenol (S)	63	%	60-125	1	03/29/18 13:52	04/05/18 16:36	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	2680	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	83-32-9	
Acenaphthylene	635	ug/kg	64.6	5	03/28/18 19:00	03/30/18 21:39	208-96-8	
Anthracene	13100	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	120-12-7	
Benzo(a)anthracene	20500	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	56-55-3	
Benzo(a)pyrene	14400	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	50-32-8	
Benzo(b)fluoranthene	18500	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	205-99-2	
Benzo(g,h,i)perylene	5740	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	191-24-2	
Benzo(k)fluoranthene	6380	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	207-08-9	
Chrysene	17700	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	218-01-9	
Dibenz(a,h)anthracene	2090	ug/kg	64.6	5	03/28/18 19:00	03/30/18 21:39	53-70-3	
Fluoranthene	46400	ug/kg	3230	250	03/28/18 19:00	04/02/18 14:48	206-44-0	
Fluorene	4030	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	86-73-7	
Indeno(1,2,3-cd)pyrene	4930	ug/kg	646	50	03/28/18 19:00	04/02/18 14:26	193-39-5	
Naphthalene	882	ug/kg	64.6	5	03/28/18 19:00	03/30/18 21:39	91-20-3	
Phenanthrene	41800	ug/kg	3230	250	03/28/18 19:00	04/02/18 14:48	85-01-8	
Pyrene	37700	ug/kg	3230	250	03/28/18 19:00	04/02/18 14:48	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	63	%	42-125	5	03/28/18 19:00	03/30/18 21:39	321-60-8	D3
p-Terphenyl-d14 (S)	95	%	57-125	5	03/28/18 19:00	03/30/18 21:39	1718-51-0	

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

Bentazon	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	25057-89-0	
2,4-D	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	94-75-7	
2,4-DB	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	94-82-6	
Dicamba	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	1918-00-9	
Dinoseb	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	88-85-7	
MCPA	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	94-74-6	
Pentachlorophenol	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	87-86-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Picloram	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	1918-02-1	
2,4,5-T	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	93-72-1	
Triclopyr	ND	mg/kg	0.43	5	03/29/18 07:30	04/04/18 19:28	55335-06-3	
Surrogates								
2,4-DCAA (S)	65	%.	46-125	5	03/29/18 07:30	04/04/18 19:28	19719-28-9	D3
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1490	1	03/28/18 15:25	03/29/18 12:48	67-64-1	
Allyl chloride	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	107-05-1	
Benzene	ND	ug/kg	29.9	1	03/28/18 15:25	03/29/18 12:48	71-43-2	
Bromobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	108-86-1	
Bromochloromethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	74-97-5	
Bromodichloromethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	75-27-4	
Bromoform	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	75-25-2	
Bromomethane	ND	ug/kg	746	1	03/28/18 15:25	03/29/18 12:48	74-83-9	
2-Butanone (MEK)	ND	ug/kg	373	1	03/28/18 15:25	03/29/18 12:48	78-93-3	
n-Butylbenzene	243	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	104-51-8	
sec-Butylbenzene	192	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	135-98-8	
tert-Butylbenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	98-06-6	
Carbon tetrachloride	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	56-23-5	
Chlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	108-90-7	
Chloroethane	ND	ug/kg	746	1	03/28/18 15:25	03/29/18 12:48	75-00-3	
Chloroform	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	67-66-3	
Chloromethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	74-87-3	
2-Chlorotoluene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	95-49-8	
4-Chlorotoluene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	746	1	03/28/18 15:25	03/29/18 12:48	96-12-8	
Dibromochloromethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	106-93-4	
Dibromomethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	75-71-8	
1,1-Dichloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	75-34-3	
1,2-Dichloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	107-06-2	
1,1-Dichloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	156-60-5	
Dichlorofluoromethane	ND	ug/kg	746	1	03/28/18 15:25	03/29/18 12:48	75-43-4	
1,2-Dichloropropane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	78-87-5	
1,3-Dichloropropane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	142-28-9	
2,2-Dichloropropane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	594-20-7	
1,1-Dichloropropene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	10061-01-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-C2 (5-17 WM) **Lab ID: 10425111003** Collected: 03/27/18 13:30 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
trans-1,3-Dichloropropene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	60-29-7	
Ethylbenzene	232	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	373	1	03/28/18 15:25	03/29/18 12:48	87-68-3	
Isopropylbenzene (Cumene)	252	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	98-82-8	
p-Isopropyltoluene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	99-87-6	
Methylene Chloride	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	373	1	03/28/18 15:25	03/29/18 12:48	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	1634-04-4	
Naphthalene	396	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	91-20-3	
n-Propylbenzene	313	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	103-65-1	
Styrene	324	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	79-34-5	N2
Tetrachloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	127-18-4	
Tetrahydrofuran	ND	ug/kg	2990	1	03/28/18 15:25	03/29/18 12:48	109-99-9	
Toluene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	79-00-5	
Trichloroethene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	299	1	03/28/18 15:25	03/29/18 12:48	76-13-1	
1,2,4-Trimethylbenzene	95.0	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	74.6	1	03/28/18 15:25	03/29/18 12:48	108-67-8	
Vinyl chloride	ND	ug/kg	29.9	1	03/28/18 15:25	03/29/18 12:48	75-01-4	
Xylene (Total)	326	ug/kg	224	1	03/28/18 15:25	03/29/18 12:48	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%	75-125	1	03/28/18 15:25	03/29/18 12:48	17060-07-0	
Toluene-d8 (S)	101	%	75-125	1	03/28/18 15:25	03/29/18 12:48	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125	1	03/28/18 15:25	03/29/18 12:48	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	0.26	10	04/02/18 15:00	04/04/18 13:19	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	51.1	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.54	mg/kg	0.44	1	04/05/18 10:35	04/05/18 14:34	57-12-5	B
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/02/18 15:30	04/03/18 17:22	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	8.53	1	04/04/18 10:58	04/06/18 14:51	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	309-00-2	
alpha-BHC	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	319-84-6	
beta-BHC	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	319-85-7	
delta-BHC	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	58-89-9	
Chlordane (Technical)	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	57-74-9	
alpha-Chlordane	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	5103-71-9	
gamma-Chlordane	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	5103-74-2	
4,4'-DDD	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	72-54-8	
4,4'-DDE	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	72-55-9	
4,4'-DDT	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	50-29-3	
Dieldrin	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	60-57-1	
Endosulfan I	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	959-98-8	
Endosulfan II	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	33213-65-9	
Endosulfan sulfate	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	1031-07-8	
Endrin	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	72-20-8	
Endrin aldehyde	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	7421-93-4	
Endrin ketone	ND	ug/kg	190	50	03/28/18 12:51	04/06/18 00:02	53494-70-5	
Heptachlor	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	76-44-8	
Heptachlor epoxide	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	1024-57-3	
Methoxychlor	ND	ug/kg	95.4	50	03/28/18 12:51	04/06/18 00:02	72-43-5	
Toxaphene	ND	ug/kg	2860	50	03/28/18 12:51	04/06/18 00:02	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	03/28/18 12:51	04/06/18 00:02	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	50	03/28/18 12:51	04/06/18 00:02	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	12672-29-6	
PCB-1254 (Aroclor 1254)	45.2	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	11100-14-4	
PCB, Total	45.2	ug/kg	37.4	1	03/28/18 12:51	04/02/18 12:02	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	80	%	48-125	1	03/28/18 12:51	04/02/18 12:02	877-09-8	
Decachlorobiphenyl (S)	81	%	30-134	1	03/28/18 12:51	04/02/18 12:02	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) Lab ID: 10425111004 Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3710	mg/kg	526	50	03/28/18 18:58	03/29/18 16:57		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	50	03/28/18 18:58	03/29/18 16:57	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	16.9	mg/kg	11.7	1	04/03/18 15:49	04/03/18 23:09		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/03/18 15:49	04/03/18 23:09	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3640	mg/kg	11.3	1	03/30/18 05:23	04/02/18 11:52	7429-90-5	
Barium	57.0	mg/kg	0.57	1	03/30/18 05:23	04/02/18 11:52	7440-39-3	
Boron	13.1	mg/kg	8.5	1	03/30/18 05:23	04/02/18 11:52	7440-42-8	
Copper	18.5	mg/kg	0.57	1	03/30/18 05:23	04/02/18 11:52	7440-50-8	
Iron	10100	mg/kg	2.8	1	03/30/18 05:23	04/02/18 11:52	7439-89-6	
Manganese	277	mg/kg	0.28	1	03/30/18 05:23	04/02/18 11:52	7439-96-5	
Nickel	11.0	mg/kg	1.1	1	03/30/18 05:23	04/02/18 11:52	7440-02-0	
Silver	ND	mg/kg	0.57	1	03/30/18 05:23	04/02/18 11:52	7440-22-4	
Tin	8.8	mg/kg	4.2	1	03/30/18 05:23	04/02/18 11:52	7440-31-5	
Titanium	198	mg/kg	1.4	1	03/30/18 05:23	04/02/18 11:52	7440-32-6	
Zinc	171	mg/kg	1.1	1	03/30/18 05:23	04/02/18 11:52	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	15.7	mg/kg	1.1	5	04/04/18 17:21	04/08/18 15:24	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7440-36-0	
Arsenic	3.9	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7440-38-2	
Beryllium	0.33	mg/kg	0.22	20	03/30/18 05:24	03/30/18 10:53	7440-41-7	
Cadmium	0.41	mg/kg	0.090	20	03/30/18 05:24	03/30/18 10:53	7440-43-9	
Cobalt	4.1	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7440-48-4	
Lead	65.3	mg/kg	0.11	20	03/30/18 05:24	03/30/18 10:53	7439-92-1	
Lithium	4.8	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7439-93-2	
Selenium	ND	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7782-49-2	
Strontium	21.2	mg/kg	0.56	20	03/30/18 05:24	03/30/18 10:53	7440-24-6	
Vanadium	19.2	mg/kg	1.1	20	03/30/18 05:24	03/30/18 10:53	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.063	mg/kg	0.021	1	03/30/18 05:24	04/04/18 17:49	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	12.6	%	0.10	1		03/29/18 13:23		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-D2 (3-12 WM)** Lab ID: **10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	208-96-8	
Anthracene	813	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	120-12-7	
Benzo(a)anthracene	1640	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	56-55-3	
Benzo(a)pyrene	1450	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	50-32-8	
Benzo(b)fluoranthene	1840	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	205-99-2	
Benzo(g,h,i)perylene	843	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	191-24-2	
Benzo(k)fluoranthene	671	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	101-55-3	
Butylbenzylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	85-68-7	
Carbazole	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	59-50-7	
4-Chloroaniline	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	108-60-1	
2-Chloronaphthalene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	91-58-7	
2-Chlorophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	7005-72-3	
Chrysene	1570	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	53-70-3	
Dibenzofuran	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	120-83-2	
Diethylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	105-67-9	
Dimethylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	131-11-3	
Di-n-butylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1940	1	03/29/18 13:52	04/05/18 17:06	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	606-20-2	
Di-n-octylphthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	117-81-7	
Fluoranthene	4150	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	206-44-0	
Fluorene	650	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	87-68-3	
Hexachlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	118-74-1	
Hexachloroethane	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	67-72-1	
Indeno(1,2,3-cd)pyrene	719	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	193-39-5	
Isophorone	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	78-59-1	
1-Methylnaphthalene	484	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	90-12-0	
2-Methylnaphthalene	562	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	754	1	03/29/18 13:52	04/05/18 17:06		
Naphthalene	572	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	91-20-3	
2-Nitroaniline	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	88-74-4	
3-Nitroaniline	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	99-09-2	
4-Nitroaniline	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	100-01-6	
Nitrobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	98-95-3	
2-Nitrophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	88-75-5	
4-Nitrophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	86-30-6	
Pentachlorophenol	ND	ug/kg	766	1	03/29/18 13:52	04/05/18 17:06	87-86-5	
Phenanthrene	3680	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	85-01-8	
Phenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	108-95-2	
Pyrene	4440	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	377	1	03/29/18 13:52	04/05/18 17:06	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	57	%	43-125	1	03/29/18 13:52	04/05/18 17:06	4165-60-0	
2-Fluorobiphenyl (S)	65	%	30-132	1	03/29/18 13:52	04/05/18 17:06	321-60-8	
p-Terphenyl-d14 (S)	77	%	62-125	1	03/29/18 13:52	04/05/18 17:06	1718-51-0	
Phenol-d6 (S)	65	%	48-125	1	03/29/18 13:52	04/05/18 17:06	13127-88-3	
2-Fluorophenol (S)	65	%	40-125	1	03/29/18 13:52	04/05/18 17:06	367-12-4	
2,4,6-Tribromophenol (S)	64	%	60-125	1	03/29/18 13:52	04/05/18 17:06	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	334	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	83-32-9	
Acenaphthylene	287	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	208-96-8	
Anthracene	777	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	120-12-7	
Benzo(a)anthracene	1070	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	56-55-3	
Benzo(a)pyrene	1000	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	50-32-8	
Benzo(b)fluoranthene	1100	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	205-99-2	
Benzo(g,h,i)perylene	648	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	191-24-2	
Benzo(k)fluoranthene	425	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	207-08-9	
Chrysene	982	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	218-01-9	
Dibenz(a,h)anthracene	168	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	53-70-3	
Fluoranthene	2530	ug/kg	114	10	03/28/18 19:00	04/02/18 15:10	206-44-0	
Fluorene	553	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	86-73-7	
Indeno(1,2,3-cd)pyrene	521	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	193-39-5	
Naphthalene	486	ug/kg	56.9	5	03/28/18 19:00	03/30/18 22:01	91-20-3	
Phenanthrene	2390	ug/kg	114	10	03/28/18 19:00	04/02/18 15:10	85-01-8	
Pyrene	2390	ug/kg	114	10	03/28/18 19:00	04/02/18 15:10	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	70	%	42-125	5	03/28/18 19:00	03/30/18 22:01	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-D2 (3-12 WM)** Lab ID: **10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Surrogates								
p-Terphenyl-d14 (S)	80	%.	57-125	5	03/28/18 19:00	03/30/18 22:01	1718-51-0	
8270D MSSV MDA LIST 2 Analytical Method: EPA 8270D Preparation Method: EPA 3546								
Bentazon	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	25057-89-0	
2,4-D	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	94-75-7	
2,4-DB	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	94-82-6	
Dicamba	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	1918-00-9	
Dinoseb	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	88-85-7	
MCPA	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	94-74-6	
Pentachlorophenol	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	87-86-5	
Picloram	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	1918-02-1	
2,4,5-T	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	93-72-1	
Triclopyr	ND	mg/kg	0.19	5	03/29/18 07:30	04/04/18 19:43	55335-06-3	
Surrogates								
2,4-DCAA (S)	71	%.	46-125	5	03/29/18 07:30	04/04/18 19:43	19719-28-9	D3
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1180	1	03/28/18 15:25	03/29/18 12:15	67-64-1	
Allyl chloride	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	107-05-1	
Benzene	ND	ug/kg	23.5	1	03/28/18 15:25	03/29/18 12:15	71-43-2	
Bromobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	108-86-1	
Bromochloromethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	74-97-5	
Bromodichloromethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	75-27-4	
Bromoform	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	75-25-2	
Bromomethane	ND	ug/kg	588	1	03/28/18 15:25	03/29/18 12:15	74-83-9	
2-Butanone (MEK)	ND	ug/kg	294	1	03/28/18 15:25	03/29/18 12:15	78-93-3	
n-Butylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	98-06-6	
Carbon tetrachloride	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	56-23-5	
Chlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	108-90-7	
Chloroethane	ND	ug/kg	588	1	03/28/18 15:25	03/29/18 12:15	75-00-3	
Chloroform	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	67-66-3	
Chloromethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	588	1	03/28/18 15:25	03/29/18 12:15	96-12-8	
Dibromochloromethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	106-93-4	
Dibromomethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	75-71-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,1-Dichloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	107-06-2	
1,1-Dichloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	156-60-5	
Dichlorofluoromethane	ND	ug/kg	588	1	03/28/18 15:25	03/29/18 12:15	75-43-4	
1,2-Dichloropropane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	60-29-7	
Ethylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	294	1	03/28/18 15:25	03/29/18 12:15	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	98-82-8	
p-Isopropyltoluene	68.5	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	99-87-6	
Methylene Chloride	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	294	1	03/28/18 15:25	03/29/18 12:15	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	1634-04-4	
Naphthalene	8480	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	91-20-3	
n-Propylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	103-65-1	
Styrene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	79-34-5	N2
Tetrachloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	127-18-4	
Tetrahydrofuran	ND	ug/kg	2350	1	03/28/18 15:25	03/29/18 12:15	109-99-9	
Toluene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	79-00-5	
Trichloroethene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	235	1	03/28/18 15:25	03/29/18 12:15	76-13-1	
1,2,4-Trimethylbenzene	148	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	58.8	1	03/28/18 15:25	03/29/18 12:15	108-67-8	
Vinyl chloride	ND	ug/kg	23.5	1	03/28/18 15:25	03/29/18 12:15	75-01-4	
Xylene (Total)	ND	ug/kg	176	1	03/28/18 15:25	03/29/18 12:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	91	%.	75-125	1	03/28/18 15:25	03/29/18 12:15	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	03/28/18 15:25	03/29/18 12:15	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125	1	03/28/18 15:25	03/29/18 12:15	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-D2 (3-12 WM) **Lab ID: 10425111004** Collected: 03/27/18 14:10 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
7196 Chromium, Hexavalent Analytical Method: EPA 7196A Preparation Method: EPA 3060A								
Chromium, Hexavalent	ND	mg/kg	23.0	10	04/02/18 15:00	04/04/18 14:00	18540-29-9	D3
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	15.7	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total Analytical Method: EPA 9012 Preparation Method: EPA 9012A								
Cyanide	ND	mg/kg	0.36	1	04/05/18 10:35	04/05/18 14:38	57-12-5	
9056 IC Anions Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Fluoride	ND	mg/kg	0.99	1	04/02/18 15:30	04/03/18 17:41	16984-48-8	

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.2	1	04/04/18 10:58	04/06/18 15:11	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	309-00-2	
alpha-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	319-84-6	
beta-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	319-85-7	
delta-BHC	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	58-89-9	
Chlordane (Technical)	ND	ug/kg	45.9	2	03/28/18 12:51	04/05/18 21:17	57-74-9	
alpha-Chlordane	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	5103-71-9	
gamma-Chlordane	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	5103-74-2	
4,4'-DDD	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	72-54-8	
4,4'-DDE	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	72-55-9	
4,4'-DDT	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	50-29-3	
Dieldrin	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	60-57-1	
Endosulfan I	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	959-98-8	
Endosulfan II	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	33213-65-9	
Endosulfan sulfate	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	1031-07-8	
Endrin	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	72-20-8	
Endrin aldehyde	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	7421-93-4	
Endrin ketone	ND	ug/kg	9.1	2	03/28/18 12:51	04/05/18 21:17	53494-70-5	
Heptachlor	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	76-44-8	
Heptachlor epoxide	ND	ug/kg	4.6	2	03/28/18 12:51	04/05/18 21:17	1024-57-3	
Methoxychlor	ND	ug/kg	45.9	2	03/28/18 12:51	04/05/18 21:17	72-43-5	
Toxaphene	ND	ug/kg	137	2	03/28/18 12:51	04/05/18 21:17	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	54	%	30-150	2	03/28/18 12:51	04/05/18 21:17	877-09-8	6M, D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-E2 (11-21 S)** Lab ID: **10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Surrogates								
Decachlorobiphenyl (S)	79	%.	30-150	2	03/28/18 12:51	04/05/18 21:17	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	11100-14-4	
PCB, Total	ND	ug/kg	45.4	1	03/28/18 12:51	04/02/18 13:36	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	79	%.	48-125	1	03/28/18 12:51	04/02/18 13:36	877-09-8	
Decachlorobiphenyl (S)	85	%.	30-134	1	03/28/18 12:51	04/02/18 13:36	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	12.7	1	03/28/18 18:58	03/29/18 14:36		
Surrogates								
n-Triacontane (S)	86	%.	50-150	1	03/28/18 18:58	03/29/18 14:36	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.9	1	04/03/18 15:49	04/03/18 20:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	100	%.	80-150	1	04/03/18 15:49	04/03/18 20:21	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9940	mg/kg	12.8	1	03/30/18 05:23	04/02/18 11:56	7429-90-5	
Barium	144	mg/kg	0.64	1	03/30/18 05:23	04/02/18 11:56	7440-39-3	
Boron	439	mg/kg	9.6	1	03/30/18 05:23	04/02/18 11:56	7440-42-8	
Copper	20.1	mg/kg	0.64	1	03/30/18 05:23	04/02/18 11:56	7440-50-8	
Iron	31500	mg/kg	15.9	5	03/30/18 05:23	04/02/18 13:00	7439-89-6	
Manganese	173	mg/kg	0.32	1	03/30/18 05:23	04/02/18 11:56	7439-96-5	
Nickel	62.7	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:56	7440-02-0	
Silver	ND	mg/kg	0.64	1	03/30/18 05:23	04/02/18 11:56	7440-22-4	
Tin	ND	mg/kg	4.8	1	03/30/18 05:23	04/02/18 11:56	7440-31-5	
Titanium	558	mg/kg	1.6	1	03/30/18 05:23	04/02/18 11:56	7440-32-6	
Zinc	154	mg/kg	1.3	1	03/30/18 05:23	04/02/18 11:56	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	47.5	mg/kg	1.2	5	04/04/18 17:21	04/08/18 15:28	7440-47-3	N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	2.0	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7440-36-0	
Arsenic	21.1	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7440-38-2	
Beryllium	2.6	mg/kg	0.28	20	03/30/18 05:24	03/30/18 10:55	7440-41-7	
Cadmium	1.8	mg/kg	0.11	20	03/30/18 05:24	03/30/18 10:55	7440-43-9	
Cobalt	6.7	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7440-48-4	
Lead	29.0	mg/kg	0.14	20	03/30/18 05:24	03/30/18 10:55	7439-92-1	
Lithium	10.7	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7439-93-2	
Selenium	5.1	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7782-49-2	
Strontium	60.9	mg/kg	0.69	20	03/30/18 05:24	03/30/18 10:55	7440-24-6	
Vanadium	301	mg/kg	1.4	20	03/30/18 05:24	03/30/18 10:55	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.033	mg/kg	0.028	1	03/30/18 05:24	04/04/18 17:56	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	27.4	%	0.10	1		03/29/18 13:24		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	83-32-9	
Acenaphthylene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	208-96-8	
Anthracene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	120-12-7	
Benzo(a)anthracene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	56-55-3	
Benzo(a)pyrene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	101-55-3	
Butylbenzylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	85-68-7	
Carbazole	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	59-50-7	
4-Chloroaniline	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	108-60-1	
2-Chloronaphthalene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	91-58-7	
2-Chlorophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	7005-72-3	
Chrysene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	53-70-3	
Dibenzofuran	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-E2 (11-21 S)** Lab ID: **10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Diethylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	105-67-9	
Dimethylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	131-11-3	
Di-n-butylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2340	1	03/29/18 13:52	04/05/18 17:36	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	606-20-2	
Di-n-octylphthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	117-81-7	
Fluoranthene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	206-44-0	
Fluorene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	87-68-3	
Hexachlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	118-74-1	
Hexachloroethane	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	193-39-5	
Isophorone	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	78-59-1	
1-Methylnaphthalene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	908	1	03/29/18 13:52	04/05/18 17:36		
Naphthalene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	91-20-3	
2-Nitroaniline	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	88-74-4	
3-Nitroaniline	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	99-09-2	
4-Nitroaniline	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	100-01-6	
Nitrobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	98-95-3	
2-Nitrophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	88-75-5	
4-Nitrophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	86-30-6	
Pentachlorophenol	ND	ug/kg	922	1	03/29/18 13:52	04/05/18 17:36	87-86-5	
Phenanthrene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	85-01-8	
Phenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	108-95-2	
Pyrene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	454	1	03/29/18 13:52	04/05/18 17:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	60	%	43-125	1	03/29/18 13:52	04/05/18 17:36	4165-60-0	
2-Fluorobiphenyl (S)	59	%	30-132	1	03/29/18 13:52	04/05/18 17:36	321-60-8	
p-Terphenyl-d14 (S)	84	%	62-125	1	03/29/18 13:52	04/05/18 17:36	1718-51-0	
Phenol-d6 (S)	72	%	48-125	1	03/29/18 13:52	04/05/18 17:36	13127-88-3	
2-Fluorophenol (S)	74	%	40-125	1	03/29/18 13:52	04/05/18 17:36	367-12-4	
2,4,6-Tribromophenol (S)	73	%	60-125	1	03/29/18 13:52	04/05/18 17:36	118-79-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID:** 10425111005 Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	83-32-9	
Acenaphthylene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	208-96-8	
Anthracene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	120-12-7	
Benzo(a)anthracene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	56-55-3	
Benzo(a)pyrene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	207-08-9	
Chrysene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	53-70-3	
Fluoranthene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	206-44-0	
Fluorene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	193-39-5	
Naphthalene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	91-20-3	
Phenanthrene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	85-01-8	
Pyrene	ND	ug/kg	13.8	1	04/03/18 17:20	04/04/18 12:46	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	63	%.	42-125	1	04/03/18 17:20	04/04/18 12:46	321-60-8	
p-Terphenyl-d14 (S)	88	%.	57-125	1	04/03/18 17:20	04/04/18 12:46	1718-51-0	
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
Bentazon	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	25057-89-0	
2,4-D	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	94-75-7	
2,4-DB	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	94-82-6	
Dicamba	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	1918-00-9	
Dinoseb	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	88-85-7	
MCPA	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	94-74-6	
Pentachlorophenol	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	87-86-5	
Picloram	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	1918-02-1	
2,4,5-T	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	93-72-1	
Triclopyr	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 17:45	55335-06-3	
Surrogates								
2,4-DCAA (S)	52	%.	46-125	1	03/29/18 07:30	04/04/18 17:45	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1460	1	03/28/18 15:25	03/29/18 11:58	67-64-1	
Allyl chloride	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	107-05-1	
Benzene	ND	ug/kg	29.3	1	03/28/18 15:25	03/29/18 11:58	71-43-2	
Bromobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	108-86-1	
Bromochloromethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	74-97-5	
Bromodichloromethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	75-27-4	
Bromoform	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	75-25-2	
Bromomethane	ND	ug/kg	731	1	03/28/18 15:25	03/29/18 11:58	74-83-9	
2-Butanone (MEK)	ND	ug/kg	366	1	03/28/18 15:25	03/29/18 11:58	78-93-3	
n-Butylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
sec-Butylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	135-98-8	
tert-Butylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	98-06-6	
Carbon tetrachloride	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	56-23-5	
Chlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	108-90-7	
Chloroethane	ND	ug/kg	731	1	03/28/18 15:25	03/29/18 11:58	75-00-3	
Chloroform	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	67-66-3	
Chloromethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	74-87-3	
2-Chlorotoluene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	95-49-8	
4-Chlorotoluene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	731	1	03/28/18 15:25	03/29/18 11:58	96-12-8	
Dibromochloromethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	106-93-4	
Dibromomethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	75-71-8	
1,1-Dichloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	75-34-3	
1,2-Dichloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	107-06-2	
1,1-Dichloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	156-60-5	
Dichlorofluoromethane	ND	ug/kg	731	1	03/28/18 15:25	03/29/18 11:58	75-43-4	
1,2-Dichloropropane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	78-87-5	
1,3-Dichloropropane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	142-28-9	
2,2-Dichloropropane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	594-20-7	
1,1-Dichloropropene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	60-29-7	
Ethylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	366	1	03/28/18 15:25	03/29/18 11:58	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	98-82-8	
p-Isopropyltoluene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	99-87-6	
Methylene Chloride	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	366	1	03/28/18 15:25	03/29/18 11:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	1634-04-4	
Naphthalene	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	91-20-3	
n-Propylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	103-65-1	
Styrene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	79-34-5	N2
Tetrachloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	127-18-4	
Tetrahydrofuran	ND	ug/kg	2930	1	03/28/18 15:25	03/29/18 11:58	109-99-9	
Toluene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	87-61-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-E2 (11-21 S) **Lab ID: 10425111005** Collected: 03/27/18 15:15 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
1,2,4-Trichlorobenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	79-00-5	
Trichloroethene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	293	1	03/28/18 15:25	03/29/18 11:58	76-13-1	
1,2,4-Trimethylbenzene	120	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	73.1	1	03/28/18 15:25	03/29/18 11:58	108-67-8	
Vinyl chloride	ND	ug/kg	29.3	1	03/28/18 15:25	03/29/18 11:58	75-01-4	
Xylene (Total)	ND	ug/kg	219	1	03/28/18 15:25	03/29/18 11:58	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1	03/28/18 15:25	03/29/18 11:58	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	03/28/18 15:25	03/29/18 11:58	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	03/28/18 15:25	03/29/18 11:58	460-00-4	

7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	13.6	5	04/02/18 15:00	04/04/18 14:01	18540-29-9	D3

Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	47.5	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	

9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.60	1	04/05/18 10:35	04/05/18 14:38	57-12-5	

9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.9	mg/kg	0.98	1	04/02/18 15:30	04/03/18 18:01	16984-48-8	

Sample: FD-SB-F2 (7-13 WM) **Lab ID: 10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury		Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)						
Methyl Mercury	ND	ng/g	11.0	1	04/04/18 10:58	04/06/18 15:18	7439-97-6	N3
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA 3550						
Aldrin	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	309-00-2	
alpha-BHC	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	319-84-6	
beta-BHC	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	319-85-7	
delta-BHC	15.5	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	58-89-9	
Chlordane (Technical)	ND	ug/kg	113	5	03/28/18 12:51	04/05/18 22:12	57-74-9	
alpha-Chlordane	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-F2 (7-13 WM) **Lab ID: 10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
gamma-Chlordane	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	5103-74-2	
4,4'-DDD	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	72-54-8	
4,4'-DDE	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	72-55-9	
4,4'-DDT	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	50-29-3	
Dieldrin	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	60-57-1	
Endosulfan I	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	959-98-8	
Endosulfan II	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	33213-65-9	
Endosulfan sulfate	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	1031-07-8	
Endrin	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	72-20-8	
Endrin aldehyde	ND	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	7421-93-4	
Endrin ketone	52.1	ug/kg	22.6	5	03/28/18 12:51	04/05/18 22:12	53494-70-5	
Heptachlor	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.3	5	03/28/18 12:51	04/05/18 22:12	1024-57-3	
Methoxychlor	ND	ug/kg	113	5	03/28/18 12:51	04/05/18 22:12	72-43-5	
Toxaphene	ND	ug/kg	340	5	03/28/18 12:51	04/05/18 22:12	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	30-150	5	03/28/18 12:51	04/05/18 22:12	877-09-8	5M, D4
Decachlorobiphenyl (S)	93	%	30-150	5	03/28/18 12:51	04/05/18 22:12	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11141-16-5	
PCB-1242 (Aroclor 1242)	1740	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	11100-14-4	
PCB, Total	1740	ug/kg	44.9	1	03/28/18 12:51	04/02/18 13:52	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%	48-125	1	03/28/18 12:51	04/02/18 13:52	877-09-8	
Decachlorobiphenyl (S)	86	%	30-134	1	03/28/18 12:51	04/02/18 13:52	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	61.7	mg/kg	23.8	2	03/28/18 18:58	03/29/18 17:04		T6
Surrogates								
n-Triacontane (S)	75	%	50-150	2	03/28/18 18:58	03/29/18 17:04	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	14.6	mg/kg	13.8	1	04/03/18 15:49	04/03/18 21:09		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/03/18 15:49	04/03/18 21:09	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	11500	mg/kg	13.0	1	03/30/18 05:23	04/02/18 12:00	7429-90-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-F2 (7-13 WM) Lab ID: 10425111006 Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP								
Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Barium	158	mg/kg	0.65	1	03/30/18 05:23	04/02/18 12:00	7440-39-3	
Boron	157	mg/kg	9.7	1	03/30/18 05:23	04/02/18 12:00	7440-42-8	
Copper	55.8	mg/kg	0.65	1	03/30/18 05:23	04/02/18 12:00	7440-50-8	
Iron	37700	mg/kg	16.2	5	03/30/18 05:23	04/02/18 13:04	7439-89-6	
Manganese	330	mg/kg	0.32	1	03/30/18 05:23	04/02/18 12:00	7439-96-5	
Nickel	27.1	mg/kg	1.3	1	03/30/18 05:23	04/02/18 12:00	7440-02-0	
Silver	2.3	mg/kg	0.65	1	03/30/18 05:23	04/02/18 12:00	7440-22-4	
Tin	11.8	mg/kg	4.9	1	03/30/18 05:23	04/02/18 12:00	7440-31-5	
Titanium	450	mg/kg	1.6	1	03/30/18 05:23	04/02/18 12:00	7440-32-6	
Zinc	176	mg/kg	1.3	1	03/30/18 05:23	04/02/18 12:00	7440-66-6	
6020 MET ICPMS								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	52.1	mg/kg	1.3	5	04/04/18 17:21	04/08/18 15:33	7440-47-3	N2
6020A MET ICPMS								
Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	17.1	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7440-36-0	
Arsenic	20.9	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7440-38-2	
Beryllium	2.4	mg/kg	0.26	20	03/30/18 05:24	03/30/18 10:58	7440-41-7	
Cadmium	2.9	mg/kg	0.11	20	03/30/18 05:24	03/30/18 10:58	7440-43-9	
Cobalt	8.1	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7440-48-4	
Lead	88.7	mg/kg	0.13	20	03/30/18 05:24	03/30/18 10:58	7439-92-1	
Lithium	11.5	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7439-93-2	
Selenium	4.9	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7782-49-2	
Strontium	73.7	mg/kg	0.66	20	03/30/18 05:24	03/30/18 10:58	7440-24-6	
Vanadium	121	mg/kg	1.3	20	03/30/18 05:24	03/30/18 10:58	7440-62-2	
7471 Mercury								
Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.11	mg/kg	0.024	1	03/30/18 05:24	04/04/18 17:58	7439-97-6	
Dry Weight / %M by ASTM D2974								
Analytical Method: ASTM D2974								
Percent Moisture	26.6	%	0.10	1		03/29/18 13:55		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	83-32-9	
Acenaphthylene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	208-96-8	
Anthracene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	120-12-7	
Benzo(a)anthracene	1340	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	56-55-3	
Benzo(a)pyrene	1200	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	50-32-8	
Benzo(b)fluoranthene	2060	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	205-99-2	
Benzo(g,h,i)perylene	707	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	191-24-2	
Benzo(k)fluoranthene	575	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	101-55-3	
Butylbenzylphthalate	3600	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	85-68-7	
Carbazole	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	59-50-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-F2 (7-13 WM) **Lab ID: 10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
4-Chloroaniline	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	108-60-1	
2-Chloronaphthalene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	91-58-7	
2-Chlorophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	7005-72-3	
Chrysene	1580	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	53-70-3	
Dibenzofuran	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	120-83-2	
Diethylphthalate	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	105-67-9	
Dimethylphthalate	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	131-11-3	
Di-n-butylphthalate	800	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2320	1	03/29/18 13:52	04/05/18 18:06	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	606-20-2	
Di-n-octylphthalate	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	122-66-7	
bis(2-Ethylhexyl)phthalate	118000	ug/kg	22500	50	03/29/18 13:52	04/08/18 19:06	117-81-7	
Fluoranthene	4360	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	206-44-0	
Fluorene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	87-68-3	
Hexachlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	118-74-1	
Hexachloroethane	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	67-72-1	
Indeno(1,2,3-cd)pyrene	631	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	193-39-5	
Isophorone	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	78-59-1	
1-Methylnaphthalene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	90-12-0	
2-Methylnaphthalene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	899	1	03/29/18 13:52	04/05/18 18:06		
Naphthalene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	91-20-3	
2-Nitroaniline	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	88-74-4	
3-Nitroaniline	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	99-09-2	
4-Nitroaniline	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	100-01-6	
Nitrobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	98-95-3	
2-Nitrophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	88-75-5	
4-Nitrophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	621-64-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-F2 (7-13 WM)** Lab ID: **10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

N-Nitrosodiphenylamine	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	86-30-6	
Pentachlorophenol	ND	ug/kg	913	1	03/29/18 13:52	04/05/18 18:06	87-86-5	
Phenanthrene	3120	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	85-01-8	
Phenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	108-95-2	
Pyrene	2920	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	450	1	03/29/18 13:52	04/05/18 18:06	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	63	%	43-125	1	03/29/18 13:52	04/05/18 18:06	4165-60-0	
2-Fluorobiphenyl (S)	70	%	30-132	1	03/29/18 13:52	04/05/18 18:06	321-60-8	
p-Terphenyl-d14 (S)	75	%	62-125	1	03/29/18 13:52	04/05/18 18:06	1718-51-0	
Phenol-d6 (S)	68	%	48-125	1	03/29/18 13:52	04/05/18 18:06	13127-88-3	
2-Fluorophenol (S)	68	%	40-125	1	03/29/18 13:52	04/05/18 18:06	367-12-4	
2,4,6-Tribromophenol (S)	70	%	60-125	1	03/29/18 13:52	04/05/18 18:06	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	83-32-9	
Acenaphthylene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	208-96-8	
Anthracene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	120-12-7	
Benzo(a)anthracene	30.7	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	56-55-3	
Benzo(a)pyrene	34.9	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	50-32-8	
Benzo(b)fluoranthene	48.4	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	205-99-2	
Benzo(g,h,i)perylene	22.1	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	191-24-2	
Benzo(k)fluoranthene	17.2	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	207-08-9	
Chrysene	37.9	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	53-70-3	
Fluoranthene	60.0	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	206-44-0	
Fluorene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	86-73-7	
Indeno(1,2,3-cd)pyrene	17.0	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	193-39-5	
Naphthalene	ND	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	91-20-3	
Phenanthrene	33.4	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	85-01-8	
Pyrene	59.2	ug/kg	13.6	1	03/28/18 19:00	03/30/18 16:11	129-00-0	

Surrogates

2-Fluorobiphenyl (S)	76	%	42-125	1	03/28/18 19:00	03/30/18 16:11	321-60-8	
p-Terphenyl-d14 (S)	95	%	57-125	1	03/28/18 19:00	03/30/18 16:11	1718-51-0	

8270D MSSV MDA LIST 2

Analytical Method: EPA 8270D Preparation Method: EPA 3546

Bentazon	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	25057-89-0	
2,4-D	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	94-75-7	
2,4-DB	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	94-82-6	
Dicamba	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	1918-00-9	M1, R1
Dinoseb	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	88-85-7	R1
MCPA	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	94-74-6	
Pentachlorophenol	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	87-86-5	
Picloram	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	1918-02-1	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: **FD-SB-F2 (7-13 WM)** Lab ID: **10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV MDA LIST 2		Analytical Method: EPA 8270D Preparation Method: EPA 3546						
2,4,5-T	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	93-76-5	
2,4,5-TP (Silvex)	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	93-72-1	
Triclopyr	ND	mg/kg	0.045	1	03/29/18 07:30	04/04/18 18:00	55335-06-3	
Surrogates								
2,4-DCAA (S)	69	%.	46-125	1	03/29/18 07:30	04/04/18 18:00	19719-28-9	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1420	1	03/28/18 15:25	03/29/18 13:05	67-64-1	
Allyl chloride	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	107-05-1	
Benzene	ND	ug/kg	28.4	1	03/28/18 15:25	03/29/18 13:05	71-43-2	
Bromobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	108-86-1	
Bromochloromethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	74-97-5	
Bromodichloromethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	75-27-4	
Bromoform	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	75-25-2	
Bromomethane	ND	ug/kg	710	1	03/28/18 15:25	03/29/18 13:05	74-83-9	
2-Butanone (MEK)	ND	ug/kg	355	1	03/28/18 15:25	03/29/18 13:05	78-93-3	
n-Butylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	104-51-8	
sec-Butylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	135-98-8	
tert-Butylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	98-06-6	
Carbon tetrachloride	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	56-23-5	
Chlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	108-90-7	
Chloroethane	ND	ug/kg	710	1	03/28/18 15:25	03/29/18 13:05	75-00-3	
Chloroform	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	67-66-3	
Chloromethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	74-87-3	
2-Chlorotoluene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	95-49-8	
4-Chlorotoluene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	710	1	03/28/18 15:25	03/29/18 13:05	96-12-8	
Dibromochloromethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	106-93-4	
Dibromomethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	75-71-8	
1,1-Dichloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	75-34-3	
1,2-Dichloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	107-06-2	
1,1-Dichloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	156-60-5	
Dichlorofluoromethane	ND	ug/kg	710	1	03/28/18 15:25	03/29/18 13:05	75-43-4	
1,2-Dichloropropane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	78-87-5	
1,3-Dichloropropane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	142-28-9	
2,2-Dichloropropane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	594-20-7	
1,1-Dichloropropene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	10061-02-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Sample: FD-SB-F2 (7-13 WM) **Lab ID: 10425111006** Collected: 03/27/18 16:20 Received: 03/27/18 16:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Diethyl ether (Ethyl ether)	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	60-29-7	
Ethylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	355	1	03/28/18 15:25	03/29/18 13:05	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	98-82-8	
p-Isopropyltoluene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	99-87-6	
Methylene Chloride	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	355	1	03/28/18 15:25	03/29/18 13:05	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	1634-04-4	
Naphthalene	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	91-20-3	
n-Propylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	103-65-1	
Styrene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	79-34-5	N2
Tetrachloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	127-18-4	
Tetrahydrofuran	ND	ug/kg	2840	1	03/28/18 15:25	03/29/18 13:05	109-99-9	
Toluene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	79-00-5	
Trichloroethene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	79-01-6	N2
Trichlorofluoromethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	284	1	03/28/18 15:25	03/29/18 13:05	76-13-1	
1,2,4-Trimethylbenzene	94.7	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	71.0	1	03/28/18 15:25	03/29/18 13:05	108-67-8	
Vinyl chloride	ND	ug/kg	28.4	1	03/28/18 15:25	03/29/18 13:05	75-01-4	
Xylene (Total)	ND	ug/kg	213	1	03/28/18 15:25	03/29/18 13:05	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	03/28/18 15:25	03/29/18 13:05	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	03/28/18 15:25	03/29/18 13:05	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125	1	03/28/18 15:25	03/29/18 13:05	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	27.0	10	04/02/18 15:00	04/04/18 14:01	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	52.1	mg/kg	1.0	1		04/10/18 07:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.45	mg/kg	0.40	1	04/05/18 10:35	04/05/18 14:39	57-12-5	B
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.97	1	04/02/18 15:30	04/03/18 18:20	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

QC Batch: 140178 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 555070 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.18	04/06/18 13:51	N3

METHOD BLANK: 555071 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.20	04/06/18 13:58	N3

METHOD BLANK: 555072 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.03	04/06/18 14:05	N3

LABORATORY CONTROL SAMPLE: 555073

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	105	90.2	86	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 555074 555075

Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	446	407	290	293	65	72	65-135	1	35	N3

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 530355 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2878567 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/03/18 18:43	
a,a,a-Trifluorotoluene (S)	%.	100	80-150	04/03/18 18:43	

LABORATORY CONTROL SAMPLE & LCSD: 2878568 2878569

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	44.7	44.7	89	89	80-120	0	20	
a,a,a-Trifluorotoluene (S)	%.				99	99	80-150			

MATRIX SPIKE SAMPLE: 2879442

Parameter	Units	10425111005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg		ND	74.7	75.8	98	80-120
a,a,a-Trifluorotoluene (S)	%.				99	80-150	

SAMPLE DUPLICATE: 2879443

Parameter	Units	10425111006 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	14.6	11.2J		20	
a,a,a-Trifluorotoluene (S)	%.	98	99	8		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529756 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2875501 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/04/18 17:35	

LABORATORY CONTROL SAMPLE: 2875502

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.43	0.48	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875503 2875504

Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.070	.66	.62	0.77	0.74	105	107	80-120	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529753 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2875489 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.8	04/02/18 11:01	
Barium	mg/kg	ND	0.49	04/02/18 11:01	
Boron	mg/kg	ND	7.4	04/02/18 11:01	
Copper	mg/kg	ND	0.49	04/02/18 11:01	
Iron	mg/kg	ND	2.5	04/02/18 11:01	
Manganese	mg/kg	ND	0.25	04/02/18 11:01	
Nickel	mg/kg	ND	0.98	04/02/18 11:01	
Silver	mg/kg	ND	0.49	04/02/18 11:01	
Tin	mg/kg	ND	3.7	04/02/18 11:01	
Titanium	mg/kg	ND	1.2	04/02/18 11:01	
Zinc	mg/kg	ND	0.98	04/02/18 11:01	

LABORATORY CONTROL SAMPLE: 2875490

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	962	995	104	80-120	
Barium	mg/kg	48.1	50.8	106	80-120	
Boron	mg/kg	48.1	46.1	96	80-120	
Copper	mg/kg	48.1	50.1	104	80-120	
Iron	mg/kg	962	1000	104	80-120	
Manganese	mg/kg	48.1	50.7	105	80-120	
Nickel	mg/kg	48.1	50.0	104	80-120	
Silver	mg/kg	24	24.0	100	80-120	
Tin	mg/kg	48.1	50.5	105	80-120	
Titanium	mg/kg	48.1	50.3	105	80-120	
Zinc	mg/kg	48.1	50.6	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875491 2875492

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425453001 Result	Spike Conc.	Spike Conc.	Result							
Aluminum	mg/kg	4040	1100	1110	5880	4800	167	68	75-125	20	20	P6
Barium	mg/kg	46.6	54.9	55.5	623	93.7	1050	85	75-125	148	20	M1,R1
Boron	mg/kg	ND	54.9	55.5	62.8	60.0	101	95	75-125	5	20	
Copper	mg/kg	8.5	54.9	55.5	69.6	61.1	111	95	75-125	13	20	
Iron	mg/kg	11200	1100	1110	13600	10000	223	-107	75-125	31	20	P6,R1
Manganese	mg/kg	442	54.9	55.5	9660	528	16800	157	75-125	179	20	P6
Nickel	mg/kg	9.3	54.9	55.5	182	58.9	313	89	75-125	102	20	M1,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	10425453001		2875491		2875492		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result							
Silver	mg/kg	ND	27.5	27.7	26.2	26.6	95	96	75-125	1	20			
Tin	mg/kg	ND	54.9	55.5	53.5	50.4	95	88	75-125	6	20			
Titanium	mg/kg	158	54.9	55.5	256	219	179	111	75-125	16	20	M1		
Zinc	mg/kg	59.3	54.9	55.5	130	90.5	129	56	75-125	36	20	M1, R1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 435596

Analysis Method: EPA 6020

QC Batch Method: EPA 3050B

Analysis Description: 6020 MET

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2011670

Matrix: Solid

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	04/08/18 14:34	N2

LABORATORY CONTROL SAMPLE: 2011671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.8	102	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011672 2011673

Parameter	Units	2011672		2011673		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium	mg/kg	51.1	4.81	4.81	48.6	136	-52	1770	75-125	95	20	1M, E, M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

QC Batch: 529754 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2875493 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.48	03/30/18 10:14	
Arsenic	mg/kg	ND	0.48	03/30/18 10:14	
Beryllium	mg/kg	ND	0.19	03/30/18 10:14	
Cadmium	mg/kg	ND	0.077	03/30/18 10:14	
Cobalt	mg/kg	ND	0.48	03/30/18 10:14	
Lead	mg/kg	ND	0.096	03/30/18 10:14	
Lithium	mg/kg	ND	0.48	03/30/18 10:14	
Selenium	mg/kg	ND	0.48	03/30/18 10:14	
Strontium	mg/kg	ND	0.48	03/30/18 10:14	
Vanadium	mg/kg	ND	0.96	03/30/18 10:14	

LABORATORY CONTROL SAMPLE: 2875494

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	48.5	46.2	95	80-120	
Arsenic	mg/kg	48.5	46.3	95	80-120	
Beryllium	mg/kg	48.5	47.1	97	80-120	
Cadmium	mg/kg	48.5	46.4	96	80-120	
Cobalt	mg/kg	48.5	47.7	98	80-120	
Lead	mg/kg	48.5	49.3	102	80-120	
Lithium	mg/kg	48.5	48.0	99	80-120	
Selenium	mg/kg	48.5	49.9	103	80-120	
Strontium	mg/kg	48.5	47.2	97	80-120	
Vanadium	mg/kg	48.5	47.5	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875495 2875496

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony	mg/kg	2.0	66.2	66.7	46.1	46.6	67	67	75-125	1	20	M6
Arsenic	mg/kg	23.3	66.2	66.7	83.3	87.7	91	96	75-125	5	20	
Beryllium	mg/kg	3.1	66.2	66.7	63.4	63.2	91	90	75-125	0	20	
Cadmium	mg/kg	2.3	66.2	66.7	65.1	67.0	95	97	75-125	3	20	
Cobalt	mg/kg	8.3	66.2	66.7	71.9	72.9	96	97	75-125	1	20	
Lead	mg/kg	37.7	66.2	66.7	107	119	105	122	75-125	11	20	
Lithium	mg/kg	14.9	66.2	66.7	75.7	75.2	92	90	75-125	1	20	
Selenium	mg/kg	5.4	66.2	66.7	67.5	69.2	94	96	75-125	3	20	
Strontium	mg/kg	77.3	66.2	66.7	135	137	87	90	75-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2875495		2875496									
Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Vanadium	mg/kg	124	66.2	66.7	199	207	113	124	75-125	4	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529638	Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974	Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10425111006	

SAMPLE DUPLICATE: 2874717

Parameter	Units	10425324012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.7	11.8	8	30	

SAMPLE DUPLICATE: 2875004

Parameter	Units	12106379001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	52.5	53.3	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529503 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2873977 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,1,1-Trichloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	03/28/18 21:05	N2
1,1,2-Trichloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	03/28/18 21:05	
1,1-Dichloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,1-Dichloroethene	ug/kg	ND	50.0	03/28/18 21:05	
1,1-Dichloropropene	ug/kg	ND	50.0	03/28/18 21:05	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,2,3-Trichloropropane	ug/kg	ND	200	03/28/18 21:05	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	03/28/18 21:05	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	03/28/18 21:05	
1,2-Dichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,2-Dichloroethane	ug/kg	ND	50.0	03/28/18 21:05	
1,2-Dichloropropane	ug/kg	ND	50.0	03/28/18 21:05	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,3-Dichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
1,3-Dichloropropane	ug/kg	ND	50.0	03/28/18 21:05	
1,4-Dichlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
2,2-Dichloropropane	ug/kg	ND	200	03/28/18 21:05	
2-Butanone (MEK)	ug/kg	ND	250	03/28/18 21:05	
2-Chlorotoluene	ug/kg	ND	50.0	03/28/18 21:05	
4-Chlorotoluene	ug/kg	ND	50.0	03/28/18 21:05	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	03/28/18 21:05	
Acetone	ug/kg	ND	1000	03/28/18 21:05	
Allyl chloride	ug/kg	ND	200	03/28/18 21:05	
Benzene	ug/kg	ND	20.0	03/28/18 21:05	
Bromobenzene	ug/kg	ND	50.0	03/28/18 21:05	
Bromochloromethane	ug/kg	ND	50.0	03/28/18 21:05	
Bromodichloromethane	ug/kg	ND	50.0	03/28/18 21:05	
Bromoform	ug/kg	ND	200	03/28/18 21:05	
Bromomethane	ug/kg	ND	500	03/28/18 21:05	
Carbon tetrachloride	ug/kg	ND	50.0	03/28/18 21:05	
Chlorobenzene	ug/kg	ND	50.0	03/28/18 21:05	
Chloroethane	ug/kg	ND	500	03/28/18 21:05	
Chloroform	ug/kg	ND	50.0	03/28/18 21:05	
Chloromethane	ug/kg	ND	200	03/28/18 21:05	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	03/28/18 21:05	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	03/28/18 21:05	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

METHOD BLANK: 2873977

Matrix: Solid

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	03/28/18 21:05	
Dibromomethane	ug/kg	ND	50.0	03/28/18 21:05	
Dichlorodifluoromethane	ug/kg	ND	200	03/28/18 21:05	
Dichlorofluoromethane	ug/kg	ND	500	03/28/18 21:05	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	03/28/18 21:05	
Ethylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
Hexachloro-1,3-butadiene	ug/kg	ND	250	03/28/18 21:05	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	03/28/18 21:05	
Methyl-tert-butyl ether	ug/kg	ND	50.0	03/28/18 21:05	
Methylene Chloride	ug/kg	ND	200	03/28/18 21:05	
n-Butylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
n-Propylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
Naphthalene	ug/kg	ND	200	03/28/18 21:05	
p-Isopropyltoluene	ug/kg	ND	50.0	03/28/18 21:05	
sec-Butylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
Styrene	ug/kg	ND	50.0	03/28/18 21:05	
tert-Butylbenzene	ug/kg	ND	50.0	03/28/18 21:05	
Tetrachloroethene	ug/kg	ND	50.0	03/28/18 21:05	
Tetrahydrofuran	ug/kg	ND	2000	03/28/18 21:05	
Toluene	ug/kg	ND	50.0	03/28/18 21:05	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	03/28/18 21:05	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	03/28/18 21:05	
Trichloroethene	ug/kg	ND	50.0	03/28/18 21:05	N2
Trichlorofluoromethane	ug/kg	ND	200	03/28/18 21:05	
Vinyl chloride	ug/kg	ND	20.0	03/28/18 21:05	
Xylene (Total)	ug/kg	ND	150	03/28/18 21:05	
1,2-Dichloroethane-d4 (S)	%	94	75-125	03/28/18 21:05	
4-Bromofluorobenzene (S)	%	102	75-125	03/28/18 21:05	
Toluene-d8 (S)	%	99	75-125	03/28/18 21:05	

LABORATORY CONTROL SAMPLE & LCSD: 2873978

2873979

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	899	871	90	87	59-125	3	20	
1,1,1-Trichloroethane	ug/kg	1000	906	866	91	87	59-125	5	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	933	916	93	92	58-125	2	20	N2
1,1,2-Trichloroethane	ug/kg	1000	905	857	91	86	64-125	5	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	844	836	84	84	65-125	1	20	
1,1-Dichloroethane	ug/kg	1000	873	834	87	83	63-125	5	20	
1,1-Dichloroethene	ug/kg	1000	908	896	91	90	59-125	1	20	
1,1-Dichloropropene	ug/kg	1000	974	944	97	94	64-125	3	20	
1,2,3-Trichlorobenzene	ug/kg	1000	845	863	84	86	55-126	2	20	
1,2,3-Trichloropropane	ug/kg	1000	905	833	91	83	62-125	8	20	
1,2,4-Trichlorobenzene	ug/kg	1000	864	883	86	88	62-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE & LCSD: 2873978		2873979								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	914	869	91	87	59-125	5	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1970	1850	79	74	54-125	7	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	907	836	91	84	64-125	8	20	
1,2-Dichlorobenzene	ug/kg	1000	905	849	91	85	63-125	6	20	
1,2-Dichloroethane	ug/kg	1000	809	768	81	77	57-125	5	20	
1,2-Dichloropropane	ug/kg	1000	881	846	88	85	67-125	4	20	
1,3,5-Trimethylbenzene	ug/kg	1000	903	884	90	88	59-125	2	20	
1,3-Dichlorobenzene	ug/kg	1000	848	839	85	84	64-125	1	20	
1,3-Dichloropropane	ug/kg	1000	901	849	90	85	64-125	6	20	
1,4-Dichlorobenzene	ug/kg	1000	866	823	87	82	63-125	5	20	
2,2-Dichloropropane	ug/kg	1000	915	865	91	87	37-126	6	20	
2-Butanone (MEK)	ug/kg	5000	4500	3950	90	79	48-125	13	20	
2-Chlorotoluene	ug/kg	1000	867	847	87	85	62-125	2	20	
4-Chlorotoluene	ug/kg	1000	916	881	92	88	63-125	4	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4400	4190	88	84	52-135	5	20	
Acetone	ug/kg	5000	5760	5420	115	108	65-125	6	20	
Allyl chloride	ug/kg	1000	850	823	85	82	52-125	3	20	
Benzene	ug/kg	1000	889	852	89	85	61-125	4	20	
Bromobenzene	ug/kg	1000	907	864	91	86	64-125	5	20	
Bromochloromethane	ug/kg	1000	903	854	90	85	65-125	6	20	
Bromodichloromethane	ug/kg	1000	884	863	88	86	57-125	2	20	
Bromoform	ug/kg	1000	761	768	76	77	57-125	1	20	
Bromomethane	ug/kg	1000	882	867	88	87	60-125	2	20	
Carbon tetrachloride	ug/kg	1000	895	859	89	86	58-125	4	20	
Chlorobenzene	ug/kg	1000	886	856	89	86	66-125	3	20	
Chloroethane	ug/kg	1000	890	865	89	86	62-125	3	20	
Chloroform	ug/kg	1000	801	771	80	77	59-125	4	20	
Chloromethane	ug/kg	1000	839	854	84	85	50-125	2	20	
cis-1,2-Dichloroethene	ug/kg	1000	872	819	87	82	61-125	6	20	
cis-1,3-Dichloropropene	ug/kg	1000	891	844	89	84	61-125	5	20	
Dibromochloromethane	ug/kg	1000	812	821	81	82	60-125	1	20	
Dibromomethane	ug/kg	1000	885	842	88	84	69-125	5	20	
Dichlorodifluoromethane	ug/kg	1000	758	771	76	77	38-125	2	20	
Dichlorofluoromethane	ug/kg	1000	812	852	81	85	67-125	5	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1610	1600	161	160	60-125	1	20 L3	
Ethylbenzene	ug/kg	1000	897	854	90	85	62-125	5	20	
Hexachloro-1,3-butadiene	ug/kg	1000	841	890	84	89	56-125	6	20	
Isopropylbenzene (Cumene)	ug/kg	1000	942	911	94	91	65-125	3	20	
Methyl-tert-butyl ether	ug/kg	1000	863	817	86	82	59-125	5	20	
Methylene Chloride	ug/kg	1000	900	848	90	85	64-125	6	20	
n-Butylbenzene	ug/kg	1000	913	892	91	89	59-125	2	20	
n-Propylbenzene	ug/kg	1000	911	881	91	88	61-125	3	20	
Naphthalene	ug/kg	1000	1050	928	105	93	53-125	12	20	
p-Isopropyltoluene	ug/kg	1000	924	890	92	89	63-125	4	20	
sec-Butylbenzene	ug/kg	1000	923	906	92	91	62-125	2	20	
Styrene	ug/kg	1000	937	918	94	92	66-125	2	20	
tert-Butylbenzene	ug/kg	1000	913	877	91	88	64-125	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE & LCSD: 2873978

2873979

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Tetrachloroethene	ug/kg	1000	906	889	91	89	67-125	2	20	
Tetrahydrofuran	ug/kg	10000	11500	11200	115	112	62-125	3	20	CH
Toluene	ug/kg	1000	900	864	90	86	61-125	4	20	
trans-1,2-Dichloroethene	ug/kg	1000	935	880	94	88	64-125	6	20	
trans-1,3-Dichloropropene	ug/kg	1000	907	859	91	86	56-125	5	20	
Trichloroethene	ug/kg	1000	854	818	85	82	67-125	4	20	N2
Trichlorofluoromethane	ug/kg	1000	815	837	82	84	65-125	3	20	
Vinyl chloride	ug/kg	1000	904	927	90	93	57-125	3	20	
Xylene (Total)	ug/kg	3000	2750	2640	92	88	62-125	4	20	
1,2-Dichloroethane-d4 (S)	%				96	95	75-125			
4-Bromofluorobenzene (S)	%				101	104	75-125			
Toluene-d8 (S)	%				100	102	75-125			

MATRIX SPIKE SAMPLE: 2873980

Parameter	Units	10425099001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	1120	1090	98	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1120	1180	106	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1120	1100	99	36-150	N2
1,1,2-Trichloroethane	ug/kg	ND	1120	1130	101	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1120	1020	92	60-142	
1,1-Dichloroethane	ug/kg	ND	1120	1020	92	57-140	
1,1-Dichloroethene	ug/kg	ND	1120	1100	98	59-139	
1,1-Dichloropropene	ug/kg	ND	1120	1170	105	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1120	1050	94	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1120	1020	92	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1120	1080	97	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1120	1120	97	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2790	2450	88	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1120	1090	97	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1120	1020	92	70-142	
1,2-Dichloroethane	ug/kg	ND	1120	968	87	58-132	
1,2-Dichloropropane	ug/kg	ND	1120	1080	97	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1120	1060	94	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1120	1020	91	71-142	
1,3-Dichloropropane	ug/kg	ND	1120	1070	96	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1120	991	89	68-142	
2,2-Dichloropropane	ug/kg	ND	1120	1190	107	34-150	
2-Butanone (MEK)	ug/kg	ND	5570	5770	104	51-150	
2-Chlorotoluene	ug/kg	ND	1120	1030	92	66-144	
4-Chlorotoluene	ug/kg	ND	1120	1030	93	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5570	5310	95	63-150	
Acetone	ug/kg	ND	5570	6740	121	54-150	
Allyl chloride	ug/kg	ND	1120	1070	96	53-135	
Benzene	ug/kg	1290	1120	2490	107	65-135	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

MATRIX SPIKE SAMPLE: 2873980		10425099001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1120	1030	92	71-141	
Bromochloromethane	ug/kg	ND	1120	1050	94	62-145	
Bromodichloromethane	ug/kg	ND	1120	1140	103	59-148	
Bromoform	ug/kg	ND	1120	973	87	57-145	
Bromomethane	ug/kg	ND	1120	954	86	51-129	
Carbon tetrachloride	ug/kg	ND	1120	1160	104	55-144	
Chlorobenzene	ug/kg	ND	1120	1070	96	70-142	
Chloroethane	ug/kg	ND	1120	900	81	61-135	
Chloroform	ug/kg	ND	1120	949	85	58-135	
Chloromethane	ug/kg	ND	1120	910	82	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1120	1020	92	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1120	1150	103	62-142	
Dibromochloromethane	ug/kg	ND	1120	1030	93	65-141	
Dibromomethane	ug/kg	ND	1120	1080	97	72-150	
Dichlorodifluoromethane	ug/kg	ND	1120	713	64	30-125	
Dichlorofluoromethane	ug/kg	ND	1120	883	79	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1120	2070	185	62-135	M0
Ethylbenzene	ug/kg	277	1120	1340	95	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1120	1220	109	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1120	1120	100	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1120	1000	90	63-139	
Methylene Chloride	ug/kg	ND	1120	973	87	58-135	
n-Butylbenzene	ug/kg	ND	1120	1140	102	63-150	
n-Propylbenzene	ug/kg	ND	1120	1090	97	70-146	
Naphthalene	ug/kg	ND	1120	1090	97	63-150	
p-Isopropyltoluene	ug/kg	165	1120	1280	100	72-150	
sec-Butylbenzene	ug/kg	ND	1120	1110	99	66-150	
Styrene	ug/kg	ND	1120	1110	100	72-146	
tert-Butylbenzene	ug/kg	ND	1120	1080	97	71-148	
Tetrachloroethene	ug/kg	ND	1120	1090	98	70-150	
Tetrahydrofuran	ug/kg	ND	11200	14100	127	62-150	
Toluene	ug/kg	985	1120	2400	127	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1120	1070	96	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1120	1090	98	57-147	
Trichloroethene	ug/kg	ND	1120	1090	98	62-150	N2
Trichlorofluoromethane	ug/kg	ND	1120	867	78	51-150	
Vinyl chloride	ug/kg	ND	1120	978	88	45-132	
Xylene (Total)	ug/kg	1060	3350	4460	101	75-140	
1,2-Dichloroethane-d4 (S)	%					93	75-125
4-Bromofluorobenzene (S)	%					99	75-125
Toluene-d8 (S)	%					99	75-125

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

SAMPLE DUPLICATE: 2873981

Parameter	Units	10425099002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	N2
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

SAMPLE DUPLICATE: 2873981

Parameter	Units	10425099002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	N2
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	92	92	3		
4-Bromofluorobenzene (S)	%.	102	102	2		
Toluene-d8 (S)	%.	97	99	0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529466 Analysis Method: EPA 8081B
 QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2873686 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDE	ug/kg	ND	3.3	04/05/18 18:14	
4,4'-DDT	ug/kg	ND	3.3	04/05/18 18:14	
Aldrin	ug/kg	ND	1.7	04/05/18 18:14	
alpha-BHC	ug/kg	ND	1.7	04/05/18 18:14	
alpha-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
beta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Chlordane (Technical)	ug/kg	ND	16.7	04/05/18 18:14	
delta-BHC	ug/kg	ND	1.7	04/05/18 18:14	
Dieldrin	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan I	ug/kg	ND	1.7	04/05/18 18:14	
Endosulfan II	ug/kg	ND	3.3	04/05/18 18:14	
Endosulfan sulfate	ug/kg	ND	3.3	04/05/18 18:14	
Endrin	ug/kg	ND	3.3	04/05/18 18:14	
Endrin aldehyde	ug/kg	ND	3.3	04/05/18 18:14	
Endrin ketone	ug/kg	ND	3.3	04/05/18 18:14	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/05/18 18:14	
gamma-Chlordane	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor	ug/kg	ND	1.7	04/05/18 18:14	
Heptachlor epoxide	ug/kg	ND	1.7	04/05/18 18:14	
Methoxychlor	ug/kg	ND	16.7	04/05/18 18:14	
Toxaphene	ug/kg	ND	50.0	04/05/18 18:14	
Decachlorobiphenyl (S)	%	95	30-150	04/05/18 18:14	
Tetrachloro-m-xylene (S)	%	91	30-150	04/05/18 18:14	

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.1	99	62-127	
4,4'-DDE	ug/kg	33.3	32.4	97	66-125	
4,4'-DDT	ug/kg	33.3	33.2	99	67-128 CH	
Aldrin	ug/kg	16.7	14.5	87	66-125	
alpha-BHC	ug/kg	16.7	14.8	89	64-125	
alpha-Chlordane	ug/kg	16.7	15.2	91	68-125	
beta-BHC	ug/kg	16.7	15.3	92	69-125	
delta-BHC	ug/kg	16.7	9.8	59	42-133	
Dieldrin	ug/kg	33.3	33.7	101	69-126	
Endosulfan I	ug/kg	16.7	14.1	85	63-125	
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	27.6	83	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE: 2873687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.1	93	69-125	
Endrin aldehyde	ug/kg	33.3	31.3	94	65-125	
Endrin ketone	ug/kg	33.3	34.0	102	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.3	92	67-125	
gamma-Chlordane	ug/kg	16.7	13.8	83	63-125	
Heptachlor	ug/kg	16.7	15.3	92	69-125	
Heptachlor epoxide	ug/kg	16.7	15.3	92	68-125	
Methoxychlor	ug/kg	167	165	99	65-134	CH
Decachlorobiphenyl (S)	%			90	30-150	
Tetrachloro-m-xylene (S)	%			86	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873688 2873689

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424793001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	166	166	147	154	89	93	56-125	5	20
4,4'-DDE	ug/kg	ND	166	166	154	164	93	99	32-150	6	20
4,4'-DDT	ug/kg	ND	166	166	154	158	93	95	60-132	2	20 CH
Aldrin	ug/kg	ND	82.5	83	61.8	64.2	75	78	56-125	4	20
alpha-BHC	ug/kg	ND	82.5	83	74.1	80.9	90	98	54-136	9	20
alpha-Chlordane	ug/kg	147	82.5	83	169	140	26	-9	54-133	19	20 M1
beta-BHC	ug/kg	64.3	82.5	83	79.8	87.9	19	28	30-150	10	20 M1
delta-BHC	ug/kg	ND	82.5	83	49.8	54.9	60	66	45-145	10	20
Dieldrin	ug/kg	ND	166	166	142	143	86	86	47-150	0	20
Endosulfan I	ug/kg	ND	82.5	83	66.2	70.2	80	85	35-145	6	20
Endosulfan II	ug/kg	ND	166	166	139	142	84	86	50-147	2	20
Endosulfan sulfate	ug/kg	ND	166	166	118	120	71	73	54-132	2	20
Endrin	ug/kg	ND	166	166	126	128	76	78	62-125	2	20
Endrin aldehyde	ug/kg	ND	166	166	132	132	80	80	33-150	1	20
Endrin ketone	ug/kg	ND	166	166	144	146	87	88	56-144	1	20
gamma-BHC (Lindane)	ug/kg	ND	82.5	83	66.3	68.3	80	82	63-125	3	20
gamma-Chlordane	ug/kg	129	82.5	83	141	118	14	-14	45-132	18	20 M1
Heptachlor	ug/kg	ND	82.5	83	77.5	95.3	94	115	51-142	21	20 R1
Heptachlor epoxide	ug/kg	ND	82.5	83	65.2	69.5	79	84	50-142	6	20
Methoxychlor	ug/kg	ND	825	830	810	820	98	99	58-139	1	20 CH
Decachlorobiphenyl (S)	%						60	64	30-150		
Tetrachloro-m-xylene (S)	%						57	64	30-150		6M, D4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529467 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2873690 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/02/18 10:11	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/02/18 10:11	
Decachlorobiphenyl (S)	%	88	30-134	04/02/18 10:11	
Tetrachloro-m-xylene (S)	%	88	48-125	04/02/18 10:11	

LABORATORY CONTROL SAMPLE: 2873691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	569	85	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	575	86	62-125	
Decachlorobiphenyl (S)	%			90	30-134	
Tetrachloro-m-xylene (S)	%			90	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873692 2873693

Parameter	Units	10424793002		2873692		2873693		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
PCB-1016 (Aroclor 1016)	ug/kg	ND	930	930	789	769	85	83	30-150	3	30		
PCB-1260 (Aroclor 1260)	ug/kg	ND	930	930	906	896	97	96	30-138	1	30		
Decachlorobiphenyl (S)	%						77	74	30-134				
Tetrachloro-m-xylene (S)	%						76	69	48-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529689 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2874965 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/05/18 11:11	
1,2-Dichlorobenzene	ug/kg	ND	330	04/05/18 11:11	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/05/18 11:11	
1,3-Dichlorobenzene	ug/kg	ND	330	04/05/18 11:11	
1,4-Dichlorobenzene	ug/kg	ND	330	04/05/18 11:11	
1-Methylnaphthalene	ug/kg	ND	330	04/05/18 11:11	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/05/18 11:11	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/05/18 11:11	
2,4-Dichlorophenol	ug/kg	ND	330	04/05/18 11:11	
2,4-Dimethylphenol	ug/kg	ND	330	04/05/18 11:11	
2,4-Dinitrophenol	ug/kg	ND	330	04/05/18 11:11	
2,4-Dinitrotoluene	ug/kg	ND	330	04/05/18 11:11	
2,6-Dinitrotoluene	ug/kg	ND	330	04/05/18 11:11	
2-Chloronaphthalene	ug/kg	ND	330	04/05/18 11:11	
2-Chlorophenol	ug/kg	ND	330	04/05/18 11:11	
2-Methylnaphthalene	ug/kg	ND	330	04/05/18 11:11	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/05/18 11:11	
2-Nitroaniline	ug/kg	ND	330	04/05/18 11:11	
2-Nitrophenol	ug/kg	ND	330	04/05/18 11:11	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/05/18 11:11	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/05/18 11:11	
3-Nitroaniline	ug/kg	ND	330	04/05/18 11:11	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/05/18 11:11	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/05/18 11:11	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/05/18 11:11	
4-Chloroaniline	ug/kg	ND	330	04/05/18 11:11	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/05/18 11:11	
4-Nitroaniline	ug/kg	ND	330	04/05/18 11:11	
4-Nitrophenol	ug/kg	ND	330	04/05/18 11:11	
Acenaphthene	ug/kg	ND	330	04/05/18 11:11	
Acenaphthylene	ug/kg	ND	330	04/05/18 11:11	
Anthracene	ug/kg	ND	330	04/05/18 11:11	
Benzo(a)anthracene	ug/kg	ND	330	04/05/18 11:11	
Benzo(a)pyrene	ug/kg	ND	330	04/05/18 11:11	
Benzo(b)fluoranthene	ug/kg	ND	330	04/05/18 11:11	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/05/18 11:11	
Benzo(k)fluoranthene	ug/kg	ND	330	04/05/18 11:11	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/05/18 11:11	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/05/18 11:11	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/05/18 11:11	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/05/18 11:11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

METHOD BLANK: 2874965

Matrix: Solid

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/05/18 11:11	
Carbazole	ug/kg	ND	330	04/05/18 11:11	
Chrysene	ug/kg	ND	330	04/05/18 11:11	
Di-n-butylphthalate	ug/kg	ND	330	04/05/18 11:11	
Di-n-octylphthalate	ug/kg	ND	330	04/05/18 11:11	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/05/18 11:11	
Dibenzofuran	ug/kg	ND	330	04/05/18 11:11	
Diethylphthalate	ug/kg	ND	330	04/05/18 11:11	
Dimethylphthalate	ug/kg	ND	330	04/05/18 11:11	
Fluoranthene	ug/kg	ND	330	04/05/18 11:11	
Fluorene	ug/kg	ND	330	04/05/18 11:11	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/05/18 11:11	
Hexachlorobenzene	ug/kg	ND	330	04/05/18 11:11	
Hexachloroethane	ug/kg	ND	330	04/05/18 11:11	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/05/18 11:11	
Isophorone	ug/kg	ND	330	04/05/18 11:11	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/05/18 11:11	
N-Nitrosodimethylamine	ug/kg	ND	330	04/05/18 11:11	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/05/18 11:11	
Naphthalene	ug/kg	ND	330	04/05/18 11:11	
Nitrobenzene	ug/kg	ND	330	04/05/18 11:11	
Pentachlorophenol	ug/kg	ND	670	04/05/18 11:11	
Phenanthrene	ug/kg	ND	330	04/05/18 11:11	
Phenol	ug/kg	ND	330	04/05/18 11:11	
Pyrene	ug/kg	ND	330	04/05/18 11:11	
2,4,6-Tribromophenol (S)	%	81	60-125	04/05/18 11:11	
2-Fluorobiphenyl (S)	%	99	30-132	04/05/18 11:11	
2-Fluorophenol (S)	%	92	40-125	04/05/18 11:11	
Nitrobenzene-d5 (S)	%	80	43-125	04/05/18 11:11	
p-Terphenyl-d14 (S)	%	109	62-125	04/05/18 11:11	
Phenol-d6 (S)	%	91	48-125	04/05/18 11:11	

LABORATORY CONTROL SAMPLE: 2874966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1310	79	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1270	76	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1280	77	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1260	76	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1300	78	39-125	
1-Methylnaphthalene	ug/kg	1670	1340	80	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1430	86	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1430	86	61-125	
2,4-Dichlorophenol	ug/kg	1670	1320	79	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE: 2874966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1280	77	51-125	
2,4-Dinitrophenol	ug/kg	1670	936	56	30-132	7M
2,4-Dinitrotoluene	ug/kg	1670	1410	85	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1390	84	63-125	
2-Chloronaphthalene	ug/kg	1670	1390	83	61-125	
2-Chlorophenol	ug/kg	1670	1310	79	46-125	
2-Methylnaphthalene	ug/kg	1670	1360	82	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1250	75	50-125	
2-Nitroaniline	ug/kg	1670	1270	76	61-125	
2-Nitrophenol	ug/kg	1670	1350	81	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1270	76	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1350	81	47-125	
3-Nitroaniline	ug/kg	1670	1260	75	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1130J	68	30-141	7M
4-Bromophenylphenyl ether	ug/kg	1670	1390	84	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1340	80	64-125	
4-Chloroaniline	ug/kg	1670	1080	65	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1420	85	64-125	
4-Nitroaniline	ug/kg	1670	1330	80	59-125	
4-Nitrophenol	ug/kg	1670	1170	70	54-125	
Acenaphthene	ug/kg	1670	1370	82	62-125	
Acenaphthylene	ug/kg	1670	1430	86	61-125	
Anthracene	ug/kg	1670	1470	88	66-125	
Benzo(a)anthracene	ug/kg	1670	1540	92	69-125	
Benzo(a)pyrene	ug/kg	1670	1490	89	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1480	89	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1490	89	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1460	88	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1270	76	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1170	70	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1140	68	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1480	89	69-131	
Butylbenzylphthalate	ug/kg	1670	1470	88	69-129	
Carbazole	ug/kg	1670	1450	87	66-125	
Chrysene	ug/kg	1670	1500	90	68-125	
Di-n-butylphthalate	ug/kg	1670	1410	85	69-125	
Di-n-octylphthalate	ug/kg	1670	1600	96	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1490	89	64-125	
Dibenzofuran	ug/kg	1670	1430	86	65-125	
Diethylphthalate	ug/kg	1670	1410	84	67-125	
Dimethylphthalate	ug/kg	1670	1410	85	67-125	
Fluoranthene	ug/kg	1670	1450	87	66-125	
Fluorene	ug/kg	1670	1400	84	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1270	76	40-125	
Hexachlorobenzene	ug/kg	1670	1390	83	62-125	
Hexachloroethane	ug/kg	1670	1200	72	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1510	91	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

LABORATORY CONTROL SAMPLE: 2874966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1310	79	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1250	75	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1260	76	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1420	85	65-125	
Naphthalene	ug/kg	1670	1340	81	48-125	
Nitrobenzene	ug/kg	1670	1210	73	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1450	87	66-125	
Phenol	ug/kg	1670	1280	77	46-125	
Pyrene	ug/kg	1670	1510	90	69-125	
2,4,6-Tribromophenol (S)	%			89	60-125	
2-Fluorobiphenyl (S)	%			93	30-132	
2-Fluorophenol (S)	%			85	40-125	
Nitrobenzene-d5 (S)	%			78	43-125	
p-Terphenyl-d14 (S)	%			100	62-125	
Phenol-d6 (S)	%			85	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874967 2874968

Parameter	Units	10425121002		MSD		MS		MSD		% Rec Limits	RPD	RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,2,4-Trichlorobenzene	ug/kg	<66.6	1730	1730	1210	1060	70	61	30-127	13	30		
1,2-Dichlorobenzene	ug/kg	<64.8	1730	1730	1210	1050	70	61	30-125	14	30		
1,2-Diphenylhydrazine	ug/kg	<62.0	1730	1730	1220	1090	71	63	30-150	11	30		
1,3-Dichlorobenzene	ug/kg	<64.0	1730	1730	1200	1060	69	61	30-125	12	30		
1,4-Dichlorobenzene	ug/kg	<62.5	1730	1730	1200	1060	70	62	30-125	12	30		
1-Methylnaphthalene	ug/kg	<53.9	1730	1730	1270	1130	73	66	42-125	11	30		
2,4,5-Trichlorophenol	ug/kg	<67.0	1730	1730	1380	1220	80	71	30-150	12	30		
2,4,6-Trichlorophenol	ug/kg	<48.7	1730	1730	1380	1210	80	70	30-150	14	30		
2,4-Dichlorophenol	ug/kg	<64.7	1730	1730	1290	1140	74	66	30-135	12	30		
2,4-Dimethylphenol	ug/kg	<129	1730	1730	1200	1080	69	63	30-148	10	30		
2,4-Dinitrophenol	ug/kg	<77.2	1730	1730	326J	351	19	20	30-125		30	7M, M1	
2,4-Dinitrotoluene	ug/kg	<46.4	1730	1730	1340	1220	77	71	30-150	9	30		
2,6-Dinitrotoluene	ug/kg	<47.9	1730	1730	1340	1200	78	70	30-150	11	30		
2-Chloronaphthalene	ug/kg	<48.7	1730	1730	1330	1160	77	67	30-138	14	30		
2-Chlorophenol	ug/kg	<68.2	1730	1730	1220	1060	70	61	30-130	14	30		
2-Methylnaphthalene	ug/kg	<53.2	1730	1730	1280	1120	74	65	46-125	13	30		
2-Methylphenol(o-Cresol)	ug/kg	<86.4	1730	1730	1150	1000	67	58	30-133	14	30		
2-Nitroaniline	ug/kg	<75.8	1730	1730	1240	1120	72	65	30-150	10	30		
2-Nitrophenol	ug/kg	<64.6	1730	1730	1200	1080	70	62	30-134	11	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	<77.4	1730	1730	1220	1060	70	62	30-138	14	30		
3,3'-Dichlorobenzidine	ug/kg	<82.1	1730	1730	1550	1420	90	82	30-149	9	30		
3-Nitroaniline	ug/kg	<84.0	1730	1730	1280	1190	74	69	30-150	7	30		
4,6-Dinitro-2-methylphenol	ug/kg	<138	1730	1730	441J	462J	26	27	30-133		30	7M, M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2874967		2874968									
Parameter	Units	10425121002	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
4-Bromophenylphenyl ether	ug/kg	<57.9	1730	1730	1310	1170	76	68	44-125	11	30		
4-Chloro-3-methylphenol	ug/kg	<47.6	1730	1730	1290	1180	75	69	30-150	9	30		
4-Chloroaniline	ug/kg	<96.1	1730	1730	1040	1050	60	61	30-125	1	30		
4-Chlorophenylphenyl ether	ug/kg	<47.0	1730	1730	1360	1210	79	70	44-125	12	30		
4-Nitroaniline	ug/kg	<61.2	1730	1730	1220	1130	71	65	30-150	8	30		
4-Nitrophenol	ug/kg	<99.1	1730	1730	1120	991	65	57	30-150	12	30		
Acenaphthene	ug/kg	<56.2	1730	1730	1270	1130	74	65	40-125	12	30		
Acenaphthylene	ug/kg	<47.1	1730	1730	1350	1190	78	69	30-150	13	30		
Anthracene	ug/kg	<49.4	1730	1730	1360	1210	79	70	30-150	12	30		
Benzo(a)anthracene	ug/kg	<39.9	1730	1730	1430	1260	83	73	30-150	13	30		
Benzo(a)pyrene	ug/kg	<38.9	1730	1730	1410	1260	81	73	30-150	11	30		
Benzo(b)fluoranthene	ug/kg	<41.6	1730	1730	1460	1330	85	77	30-150	10	30		
Benzo(g,h,i)perylene	ug/kg	<29.7	1730	1730	1300	1180	75	69	30-150	9	30		
Benzo(k)fluoranthene	ug/kg	<41.6	1730	1730	1390	1220	80	70	30-150	13	30		
bis(2-Chloroethoxy)methane	ug/kg	<66.6	1730	1730	1180	1060	69	62	30-134	11	30		
bis(2-Chloroethyl) ether	ug/kg	<75.2	1730	1730	1080	954	63	55	30-125	13	30		
bis(2-Chloroisopropyl) ether	ug/kg	<79.7	1730	1730	1040	909	60	53	30-125	13	30		
bis(2-Ethylhexyl)phthalate	ug/kg	<87.8	1730	1730	1380	1220	80	71	30-150	12	30		
Butylbenzylphthalate	ug/kg	<76.0	1730	1730	1350	1200	78	69	30-150	12	30		
Carbazole	ug/kg	<46.1	1730	1730	1340	1200	78	70	41-125	11	30		
Chrysene	ug/kg	<34.5	1730	1730	1400	1260	81	73	30-150	11	30		
Di-n-butylphthalate	ug/kg	<47.0	1730	1730	1330	1180	77	68	30-150	12	30		
Di-n-octylphthalate	ug/kg	<105	1730	1730	1490	1300	86	75	30-150	14	30		
Dibenz(a,h)anthracene	ug/kg	<35.4	1730	1730	1310	1190	76	69	30-150	10	30		
Dibenzofuran	ug/kg	<49.9	1730	1730	1360	1210	79	70	45-125	12	30		
Diethylphthalate	ug/kg	<40.7	1730	1730	1350	1200	78	70	30-150	12	30		
Dimethylphthalate	ug/kg	<52.9	1730	1730	1380	1220	80	71	30-150	12	30		
Fluoranthene	ug/kg	<36.7	1730	1730	1360	1220	79	70	30-150	11	30		
Fluorene	ug/kg	<47.9	1730	1730	1360	1180	79	68	30-150	14	30		
Hexachloro-1,3-butadiene	ug/kg	<79.2	1730	1730	1190	1050	69	61	30-128	13	30		
Hexachlorobenzene	ug/kg	<44.4	1730	1730	1270	1150	74	67	30-150	10	30		
Hexachloroethane	ug/kg	<70.2	1730	1730	1050	917	61	53	30-125	14	30		
Indeno(1,2,3-cd)pyrene	ug/kg	<40.0	1730	1730	1330	1190	77	69	30-150	11	30		
Isophorone	ug/kg	<78.7	1730	1730	1240	1100	72	64	30-140	12	30		
N-Nitroso-di-n-propylamine	ug/kg	<105	1730	1730	1190	1020	69	59	30-147	15	30		
N-Nitrosodimethylamine	ug/kg	<89.9	1730	1730	1210	1080	70	63	30-125	11	30		
N-Nitrosodiphenylamine	ug/kg	<42.2	1730	1730	1310	1160	76	67	30-150	13	30		
Naphthalene	ug/kg	<65.3	1730	1730	1250	1080	72	63	44-125	14	30		
Nitrobenzene	ug/kg	<69.0	1730	1730	1150	1000	67	58	30-136	14	30		
Pentachlorophenol	ug/kg	<101	1730	1730	1110	1010	64	59	30-150	9	30		
Phenanthrene	ug/kg	<47.1	1730	1730	1340	1190	77	69	30-150	12	30		
Phenol	ug/kg	<66.4	1730	1730	1220	1050	71	61	30-129	15	30		
Pyrene	ug/kg	<36.2	1730	1730	1370	1240	79	72	30-150	10	30		
2,4,6-Tribromophenol (S)	%						82	72	60-125				
2-Fluorobiphenyl (S)	%						84	73	30-132				
2-Fluorophenol (S)	%						76	66	40-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	2874967		2874968		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					70	61	43-125			
p-Terphenyl-d14 (S)	%.					90	79	62-125			
Phenol-d6 (S)	%.					77	67	48-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

QC Batch: 529470 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111006

METHOD BLANK: 2873704 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	03/30/18 12:54	
Acenaphthylene	ug/kg	ND	10.0	03/30/18 12:54	
Anthracene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(a)anthracene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(a)pyrene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(b)fluoranthene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	03/30/18 12:54	
Benzo(k)fluoranthene	ug/kg	ND	10.0	03/30/18 12:54	
Chrysene	ug/kg	ND	10.0	03/30/18 12:54	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	03/30/18 12:54	
Fluoranthene	ug/kg	ND	10.0	03/30/18 12:54	
Fluorene	ug/kg	ND	10.0	03/30/18 12:54	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	03/30/18 12:54	
Naphthalene	ug/kg	ND	10.0	03/30/18 12:54	
Phenanthrene	ug/kg	ND	10.0	03/30/18 12:54	
Pyrene	ug/kg	ND	10.0	03/30/18 12:54	
2-Fluorobiphenyl (S)	%	78	42-125	03/30/18 12:54	
p-Terphenyl-d14 (S)	%	93	57-125	03/30/18 12:54	

LABORATORY CONTROL SAMPLE: 2873705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	26.2	79	52-125	
Acenaphthylene	ug/kg	33.3	27.7	83	50-125	
Anthracene	ug/kg	33.3	31.2	94	65-125	
Benzo(a)anthracene	ug/kg	33.3	31.5	94	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.9	93	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.4	94	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	25.1	75	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	28.9	87	67-125	
Chrysene	ug/kg	33.3	28.7	86	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	23.7	71	63-125	
Fluoranthene	ug/kg	33.3	31.2	94	75-125	
Fluorene	ug/kg	33.3	25.9	78	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	24.5	73	63-125	
Naphthalene	ug/kg	33.3	26.0	78	49-125	
Phenanthrene	ug/kg	33.3	25.0	75	65-125	
Pyrene	ug/kg	33.3	29.0	87	64-125	
2-Fluorobiphenyl (S)	%			78	42-125	
p-Terphenyl-d14 (S)	%			91	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	2873706		2873707		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10425098001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	34.9	34.8	26.2	26.6	75	76	30-125	1	30		
Acenaphthylene	ug/kg	ND	34.9	34.8	30.8	30.2	88	86	30-133	2	30		
Anthracene	ug/kg	0.018 mg/kg	34.9	34.8	39.3	41.9	60	67	30-150	6	30		
Benzo(a)anthracene	ug/kg	0.13 mg/kg	34.9	34.8	111	112	-58	-58	30-150	0	30	M1	
Benzo(a)pyrene	ug/kg	0.13 mg/kg	34.9	34.8	112	110	-50	-55	30-150	2	30	M1	
Benzo(b)fluoranthene	ug/kg	0.13 mg/kg	34.9	34.8	115	114	-35	-35	30-150	0	30	M1	
Benzo(g,h,i)perylene	ug/kg	0.059 mg/kg	34.9	34.8	63.1	61.2	11	6	30-150	3	30	M1	
Benzo(k)fluoranthene	ug/kg	0.064 mg/kg	34.9	34.8	66.9	68.4	10	14	30-150	2	30	M1	
Chrysene	ug/kg	0.11 mg/kg	34.9	34.8	93.5	92.7	-37	-39	30-150	1	30	M1	
Dibenz(a,h)anthracene	ug/kg	0.012 mg/kg	34.9	34.8	32.7	30.1	58	51	30-131	8	30		
Fluoranthene	ug/kg	0.24 mg/kg	34.9	34.8	176	176	-183	-183	30-150	0	30	M1	
Fluorene	ug/kg	ND	34.9	34.8	27.0	26.3	77	75	30-147	2	30		
Indeno(1,2,3-cd)pyrene	ug/kg	0.049 mg/kg	34.9	34.8	55.6	51.5	19	7	30-150	8	30	M1	
Naphthalene	ug/kg	ND	34.9	34.8	25.3	26.4	72	76	30-131	5	30		
Phenanthrene	ug/kg	0.057 mg/kg	34.9	34.8	49.2	53.5	-24	-11	30-150	8	30	M1	
Pyrene	ug/kg	0.26 mg/kg	34.9	34.8	189	189	-211	-213	30-150	0	30	M1	
2-Fluorobiphenyl (S)	%.						73	71	42-125				
p-Terphenyl-d14 (S)	%.						89	87	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 530507	Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550	Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10425111005	

METHOD BLANK: 2879475 Matrix: Solid

Associated Lab Samples: 10425111005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/04/18 10:44	
Acenaphthylene	ug/kg	ND	10.0	04/04/18 10:44	
Anthracene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(a)anthracene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(a)pyrene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/04/18 10:44	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/04/18 10:44	
Chrysene	ug/kg	ND	10.0	04/04/18 10:44	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/04/18 10:44	
Fluoranthene	ug/kg	ND	10.0	04/04/18 10:44	
Fluorene	ug/kg	ND	10.0	04/04/18 10:44	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/04/18 10:44	
Naphthalene	ug/kg	ND	10.0	04/04/18 10:44	
Phenanthrene	ug/kg	ND	10.0	04/04/18 10:44	
Pyrene	ug/kg	ND	10.0	04/04/18 10:44	
2-Fluorobiphenyl (S)	%	81	42-125	04/04/18 10:44	
p-Terphenyl-d14 (S)	%	90	57-125	04/04/18 10:44	

LABORATORY CONTROL SAMPLE: 2879476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	20.8	62	52-125	
Acenaphthylene	ug/kg	33.3	20.0	60	50-125	
Anthracene	ug/kg	33.3	28.2	85	65-125	
Benzo(a)anthracene	ug/kg	33.3	29.0	87	60-125	
Benzo(a)pyrene	ug/kg	33.3	28.9	87	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	32.7	98	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	31.6	95	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.1	87	67-125	
Chrysene	ug/kg	33.3	30.8	92	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	34.3	103	63-125	
Fluoranthene	ug/kg	33.3	30.5	92	75-125	
Fluorene	ug/kg	33.3	23.1	69	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	33.3	100	63-125	
Naphthalene	ug/kg	33.3	18.7	56	49-125	
Phenanthrene	ug/kg	33.3	28.0	84	65-125	
Pyrene	ug/kg	33.3	29.8	90	64-125	
2-Fluorobiphenyl (S)	%			60	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	2879477		2879478		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10425835002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Acenaphthene	ug/kg	ND	35.1	35.1	20.6	25.3	59	72	30-125	21	30	
Acenaphthylene	ug/kg	ND	35.1	35.1	21.0	24.7	60	71	30-133	16	30	
Anthracene	ug/kg	ND	35.1	35.1	27.5	26.8	78	77	30-150	2	30	
Benzo(a)anthracene	ug/kg	ND	35.1	35.1	30.2	29.2	86	83	30-150	3	30	
Benzo(a)pyrene	ug/kg	ND	35.1	35.1	29.8	28.8	85	82	30-150	3	30	
Benzo(b)fluoranthene	ug/kg	ND	35.1	35.1	31.2	30.0	89	85	30-150	4	30	
Benzo(g,h,i)perylene	ug/kg	ND	35.1	35.1	33.2	33.1	95	94	30-150	0	30	
Benzo(k)fluoranthene	ug/kg	ND	35.1	35.1	33.3	31.9	95	91	30-150	4	30	
Chrysene	ug/kg	ND	35.1	35.1	30.5	29.5	87	84	30-150	4	30	
Dibenz(a,h)anthracene	ug/kg	ND	35.1	35.1	35.9	34.9	102	100	30-131	3	30	
Fluoranthene	ug/kg	ND	35.1	35.1	31.5	29.7	90	85	30-150	6	30	
Fluorene	ug/kg	ND	35.1	35.1	22.5	26.0	64	74	30-147	14	30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	35.1	35.1	34.7	33.6	99	96	30-150	3	30	
Naphthalene	ug/kg	ND	35.1	35.1	19.2	24.9	55	71	30-131	26	30	
Phenanthrene	ug/kg	ND	35.1	35.1	27.6	28.2	79	80	30-150	2	30	
Pyrene	ug/kg	ND	35.1	35.1	31.1	30.4	89	87	30-150	2	30	
2-Fluorobiphenyl (S)	%.						59	77	42-125			
p-Terphenyl-d14 (S)	%.						85	85	57-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529569 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3546 Analysis Description: MDA2 Solid MSSV
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2874519 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,5-T	mg/kg	ND	0.033	04/04/18 13:35	
2,4,5-TP (Silvex)	mg/kg	ND	0.033	04/04/18 13:35	
2,4-D	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DB	mg/kg	ND	0.033	04/04/18 13:35	
Bentazon	mg/kg	ND	0.033	04/04/18 13:35	
Dicamba	mg/kg	ND	0.033	04/04/18 13:35	
Dinoseb	mg/kg	ND	0.033	04/04/18 13:35	
MCPA	mg/kg	ND	0.033	04/04/18 13:35	
Pentachlorophenol	mg/kg	ND	0.033	04/04/18 13:35	
Picloram	mg/kg	ND	0.033	04/04/18 13:35	
Triclopyr	mg/kg	ND	0.033	04/04/18 13:35	
2,4-DCAA (S)	%	78	46-125	04/04/18 13:35	

LABORATORY CONTROL SAMPLE: 2874520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,5-T	mg/kg	.33	0.28	83	60-125	
2,4,5-TP (Silvex)	mg/kg	.33	0.26	79	61-125	
2,4-D	mg/kg	.33	0.29	86	63-125	
2,4-DB	mg/kg	.33	0.28	83	59-125	
Bentazon	mg/kg	.33	0.25	76	58-125	
Dicamba	mg/kg	.33	0.27	80	52-125	
Dinoseb	mg/kg	.33	0.18	53	35-126	
MCPA	mg/kg	.33	0.27	82	57-125	
Pentachlorophenol	mg/kg	.33	0.21	63	48-125	
Picloram	mg/kg	.33	0.24	72	47-125	
Triclopyr	mg/kg	.33	0.28	83	68-125	
2,4-DCAA (S)	%			77	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521 2874522

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10425111006 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
2,4,5-T	mg/kg	ND	.45	.45	0.19	0.21	42	45	30-145	8	20	
2,4,5-TP (Silvex)	mg/kg	ND	.45	.45	0.28	0.26	63	58	30-130	7	20	
2,4-D	mg/kg	ND	.45	.45	0.18	0.20	40	44	30-150	9	20	
2,4-DB	mg/kg	ND	.45	.45	0.35	0.33	77	72	45-126	7	20	
Bentazon	mg/kg	ND	.45	.45	0.33	0.32	73	71	30-133	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874521		2874522		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10425111006 Result	MS Spike Conc.	MSD Spike Conc.									
Dicamba	mg/kg	ND	.45	.45	0.13	0.17	29	38	30-140	28	20	M1, R1	
Dinoseb	mg/kg	ND	.45	.45	0.39	0.31	86	69	30-136	23	20	R1	
MCPA	mg/kg	ND	.45	.45	0.24	0.22	53	49	30-136	9	20		
Pentachlorophenol	mg/kg	ND	.45	.45	0.28	0.25	63	55	44-125	13	20		
Picloram	mg/kg	ND	.45	.45	.016J	0.098	3	22	30-125		20	M1	
Triclopyr	mg/kg	ND	.45	.45	0.23	0.22	51	50	30-149	3	20		
2,4-DCAA (S)	%.						65	60	46-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529461	Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO	Analysis Description: WIDRO GCS
Associated Lab Samples: 10425111001	

METHOD BLANK: 2873677 Matrix: Solid

Associated Lab Samples: 10425111001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/29/18 10:21	
n-Triacontane (S)	%.	80	50-150	03/29/18 10:21	

LABORATORY CONTROL SAMPLE & LCSD: 2873678

2873679

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	69.1	90.2	86	113	70-120	26	20	R1
n-Triacontane (S)	%.				82	75	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 529510 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2874000 Matrix: Solid

Associated Lab Samples: 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/29/18 13:11	
n-Triacontane (S)	%.	79	50-150	03/29/18 13:11	

LABORATORY CONTROL SAMPLE & LCSD: 2874001

2874002

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	89.9	95.8	112	120	70-120	6	20	
n-Triacontane (S)	%.				78	82	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

QC Batch: 435086 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 2009757 Matrix: Solid
Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/04/18 12:49	

LABORATORY CONTROL SAMPLE: 2009758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	981	901	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009842 2009843

Parameter	Units	10424937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1420	1360	ND	ND	0	0	75-125		20	2M, M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009844 2009845

Parameter	Units	10424937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	54.8	54.3	ND	ND	12	18	75-125		20	M3

SAMPLE DUPLICATE: 2009846

Parameter	Units	50193299003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 285232 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 1669245 Matrix: Solid
 Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/05/18 14:27	

LABORATORY CONTROL SAMPLE: 1669246

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669247 1669248

Parameter	Units	40166647001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.10J	2.5	2.5	2.3	2.5	88	96	80-120	7	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669249 1669250

Parameter	Units	40166870001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.16J	2.37	2.49	2.4	2.3	94	89	80-120	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

QC Batch: 139758

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

METHOD BLANK: 553544

Matrix: Solid

Associated Lab Samples: 10425111001, 10425111002, 10425111003, 10425111004, 10425111005, 10425111006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/03/18 15:44	

LABORATORY CONTROL SAMPLE: 553543

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.2	51.9	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553545 553546

Parameter	Units	10425111001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	2.3	50	49.3	13.7	18.4	23	33	80-120	29	20	M1,R1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M RPD value is outside control limits due to sample non-homogeneity.

2M Redox (174 mv) and pH (8.13) values indicate a naturally reducing matrix. This accounts for poor recovery values on the sample per method Eh/pH phase diagram.

3M Sample was black in color and slightly viscous. Sample was centrifuged and decanted.

4M Sample was black in color and viscous. Sample was centrifuged and decanted.

5M Sample was light brown in color.

6M Sample was yellow in color.

7M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

B Analyte was detected in the associated method blank.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

ANALYTE QUALIFIERS

- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425111001	FD-SB-A2 (10-20 S)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111002	FD-SB-B2 (12-21 WM)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111003	FD-SB-C2 (5-17 WM)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111004	FD-SB-D2 (3-12 WM)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111005	FD-SB-E2 (11-21 S)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111006	FD-SB-F2 (7-13 WM)	EPA 1630 (1998)	140178	EPA 1630 (1998)	140181
10425111001	FD-SB-A2 (10-20 S)	EPA 3550	529466	EPA 8081B	530402
10425111002	FD-SB-B2 (12-21 WM)	EPA 3550	529466	EPA 8081B	530402
10425111003	FD-SB-C2 (5-17 WM)	EPA 3550	529466	EPA 8081B	530402
10425111004	FD-SB-D2 (3-12 WM)	EPA 3550	529466	EPA 8081B	530402
10425111005	FD-SB-E2 (11-21 S)	EPA 3550	529466	EPA 8081B	530402
10425111006	FD-SB-F2 (7-13 WM)	EPA 3550	529466	EPA 8081B	530402
10425111001	FD-SB-A2 (10-20 S)	EPA 3550	529467	EPA 8082A	530082
10425111002	FD-SB-B2 (12-21 WM)	EPA 3550	529467	EPA 8082A	530082
10425111003	FD-SB-C2 (5-17 WM)	EPA 3550	529467	EPA 8082A	530082
10425111004	FD-SB-D2 (3-12 WM)	EPA 3550	529467	EPA 8082A	530082
10425111005	FD-SB-E2 (11-21 S)	EPA 3550	529467	EPA 8082A	530082
10425111006	FD-SB-F2 (7-13 WM)	EPA 3550	529467	EPA 8082A	530082
10425111001	FD-SB-A2 (10-20 S)	WI MOD DRO	529461	WI MOD DRO	529593
10425111002	FD-SB-B2 (12-21 WM)	WI MOD DRO	529510	WI MOD DRO	529595
10425111003	FD-SB-C2 (5-17 WM)	WI MOD DRO	529510	WI MOD DRO	529595
10425111004	FD-SB-D2 (3-12 WM)	WI MOD DRO	529510	WI MOD DRO	529595
10425111005	FD-SB-E2 (11-21 S)	WI MOD DRO	529510	WI MOD DRO	529595
10425111006	FD-SB-F2 (7-13 WM)	WI MOD DRO	529510	WI MOD DRO	529595
10425111001	FD-SB-A2 (10-20 S)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111002	FD-SB-B2 (12-21 WM)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111003	FD-SB-C2 (5-17 WM)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111004	FD-SB-D2 (3-12 WM)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111005	FD-SB-E2 (11-21 S)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111006	FD-SB-F2 (7-13 WM)	EPA 5030 Medium Soil	530355	WI MOD GRO	530506
10425111001	FD-SB-A2 (10-20 S)	EPA 3050	529753	EPA 6010C	529832
10425111002	FD-SB-B2 (12-21 WM)	EPA 3050	529753	EPA 6010C	529832
10425111003	FD-SB-C2 (5-17 WM)	EPA 3050	529753	EPA 6010C	529832
10425111004	FD-SB-D2 (3-12 WM)	EPA 3050	529753	EPA 6010C	529832
10425111005	FD-SB-E2 (11-21 S)	EPA 3050	529753	EPA 6010C	529832
10425111006	FD-SB-F2 (7-13 WM)	EPA 3050	529753	EPA 6010C	529832
10425111001	FD-SB-A2 (10-20 S)	EPA 3050B	435596	EPA 6020	435837
10425111002	FD-SB-B2 (12-21 WM)	EPA 3050B	435596	EPA 6020	435837
10425111003	FD-SB-C2 (5-17 WM)	EPA 3050B	435596	EPA 6020	435837
10425111004	FD-SB-D2 (3-12 WM)	EPA 3050B	435596	EPA 6020	435837
10425111005	FD-SB-E2 (11-21 S)	EPA 3050B	435596	EPA 6020	435837
10425111006	FD-SB-F2 (7-13 WM)	EPA 3050B	435596	EPA 6020	435837
10425111001	FD-SB-A2 (10-20 S)	EPA 3050	529754	EPA 6020A	529842
10425111002	FD-SB-B2 (12-21 WM)	EPA 3050	529754	EPA 6020A	529842
10425111003	FD-SB-C2 (5-17 WM)	EPA 3050	529754	EPA 6020A	529842

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid-Revised Report

Pace Project No.: 10425111

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425111004	FD-SB-D2 (3-12 WM)	EPA 3050	529754	EPA 6020A	529842
10425111005	FD-SB-E2 (11-21 S)	EPA 3050	529754	EPA 6020A	529842
10425111006	FD-SB-F2 (7-13 WM)	EPA 3050	529754	EPA 6020A	529842
10425111001	FD-SB-A2 (10-20 S)	EPA 7471	529756	EPA 7471	530150
10425111002	FD-SB-B2 (12-21 WM)	EPA 7471	529756	EPA 7471	530150
10425111003	FD-SB-C2 (5-17 WM)	EPA 7471	529756	EPA 7471	530150
10425111004	FD-SB-D2 (3-12 WM)	EPA 7471	529756	EPA 7471	530150
10425111005	FD-SB-E2 (11-21 S)	EPA 7471	529756	EPA 7471	530150
10425111006	FD-SB-F2 (7-13 WM)	EPA 7471	529756	EPA 7471	530150
10425111001	FD-SB-A2 (10-20 S)	ASTM D2974	529626		
10425111002	FD-SB-B2 (12-21 WM)	ASTM D2974	529626		
10425111003	FD-SB-C2 (5-17 WM)	ASTM D2974	529626		
10425111004	FD-SB-D2 (3-12 WM)	ASTM D2974	529626		
10425111005	FD-SB-E2 (11-21 S)	ASTM D2974	529626		
10425111006	FD-SB-F2 (7-13 WM)	ASTM D2974	529638		
10425111001	FD-SB-A2 (10-20 S)	EPA 3550	529689	EPA 8270D	530831
10425111002	FD-SB-B2 (12-21 WM)	EPA 3550	529689	EPA 8270D	530831
10425111003	FD-SB-C2 (5-17 WM)	EPA 3550	529689	EPA 8270D	530831
10425111004	FD-SB-D2 (3-12 WM)	EPA 3550	529689	EPA 8270D	530831
10425111005	FD-SB-E2 (11-21 S)	EPA 3550	529689	EPA 8270D	530831
10425111006	FD-SB-F2 (7-13 WM)	EPA 3550	529689	EPA 8270D	530831
10425111001	FD-SB-A2 (10-20 S)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111002	FD-SB-B2 (12-21 WM)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111003	FD-SB-C2 (5-17 WM)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111004	FD-SB-D2 (3-12 WM)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111005	FD-SB-E2 (11-21 S)	EPA 3550	530507	EPA 8270D by SIM	530599
10425111006	FD-SB-F2 (7-13 WM)	EPA 3550	529470	EPA 8270D by SIM	529943
10425111001	FD-SB-A2 (10-20 S)	EPA 3546	529569	EPA 8270D	530638
10425111002	FD-SB-B2 (12-21 WM)	EPA 3546	529569	EPA 8270D	530638
10425111003	FD-SB-C2 (5-17 WM)	EPA 3546	529569	EPA 8270D	530638
10425111004	FD-SB-D2 (3-12 WM)	EPA 3546	529569	EPA 8270D	530638
10425111005	FD-SB-E2 (11-21 S)	EPA 3546	529569	EPA 8270D	530638
10425111006	FD-SB-F2 (7-13 WM)	EPA 3546	529569	EPA 8270D	530638
10425111001	FD-SB-A2 (10-20 S)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111002	FD-SB-B2 (12-21 WM)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111003	FD-SB-C2 (5-17 WM)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111004	FD-SB-D2 (3-12 WM)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111005	FD-SB-E2 (11-21 S)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111006	FD-SB-F2 (7-13 WM)	EPA 5035/5030B	529503	EPA 8260B	529857
10425111001	FD-SB-A2 (10-20 S)	EPA 3060A	435086	EPA 7196A	435521
10425111002	FD-SB-B2 (12-21 WM)	EPA 3060A	435086	EPA 7196A	435521
10425111003	FD-SB-C2 (5-17 WM)	EPA 3060A	435086	EPA 7196A	435521
10425111004	FD-SB-D2 (3-12 WM)	EPA 3060A	435086	EPA 7196A	435521
10425111005	FD-SB-E2 (11-21 S)	EPA 3060A	435086	EPA 7196A	435521

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid-Revised Report
Pace Project No.: 10425111

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425111006	FD-SB-F2 (7-13 WM)	EPA 3060A	435086	EPA 7196A	435521
10425111001	FD-SB-A2 (10-20 S)	Trivalent Chromium Calculation	436360		
10425111002	FD-SB-B2 (12-21 WM)	Trivalent Chromium Calculation	436360		
10425111003	FD-SB-C2 (5-17 WM)	Trivalent Chromium Calculation	436360		
10425111004	FD-SB-D2 (3-12 WM)	Trivalent Chromium Calculation	436360		
10425111005	FD-SB-E2 (11-21 S)	Trivalent Chromium Calculation	436360		
10425111006	FD-SB-F2 (7-13 WM)	Trivalent Chromium Calculation	436360		
10425111001	FD-SB-A2 (10-20 S)	EPA 9012A	285232	EPA 9012	285274
10425111002	FD-SB-B2 (12-21 WM)	EPA 9012A	285232	EPA 9012	285274
10425111003	FD-SB-C2 (5-17 WM)	EPA 9012A	285232	EPA 9012	285274
10425111004	FD-SB-D2 (3-12 WM)	EPA 9012A	285232	EPA 9012	285274
10425111005	FD-SB-E2 (11-21 S)	EPA 9012A	285232	EPA 9012	285274
10425111006	FD-SB-F2 (7-13 WM)	EPA 9012A	285232	EPA 9012	285274
10425111001	FD-SB-A2 (10-20 S)	EPA 300.0	139758	EPA 9056A	139833
10425111002	FD-SB-B2 (12-21 WM)	EPA 300.0	139758	EPA 9056A	139833
10425111003	FD-SB-C2 (5-17 WM)	EPA 300.0	139758	EPA 9056A	139833
10425111004	FD-SB-D2 (3-12 WM)	EPA 300.0	139758	EPA 9056A	139833
10425111005	FD-SB-E2 (11-21 S)	EPA 300.0	139758	EPA 9056A	139833
10425111006	FD-SB-F2 (7-13 WM)	EPA 300.0	139758	EPA 9056A	139833

REPORT OF LABORATORY ANALYSIS

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March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt Client Name: MPCA FSD Project #: _____
 Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

WO# : 10425111
 PM: BM2 Due Date: 04/10/18
 CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 2.7 Cooler Temp Corrected (°C): 2.9 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 3/27/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: BA M Date: 3/28/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN
Courier: CS Logistics Fed Ex Speedee UPS **Waltco**
 Client Pace Other: _____

Project #: _____
WO# : 40166616

 40166616

Tracking #: 1677921
Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used: SR - 4 **Type of Ice:** Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature: Uncorr: 45.3 / Corr: 4, 2.5
Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no
 Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Person examining contents:
 Date: 3-29-18
 Initials: [Signature]

Chain of Custody Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis	Matrix: <u>ES</u>	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: _____
 Person Contacted: _____ Date/Time: _____ If checked, see attached form for additional comments
 Comments/ Resolution: Original client label - No times. 3-29-18 [Signature]

Project Manager Review: [Signature] **Date:** 3/29/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193231

Date/Time and Initials of person examining contents: RM 3/29/18 10410

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7909

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 1.4/1.4 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			<input checked="" type="checkbox"/>
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC?: Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:

Chain of Custody

WO#: 12106456



12106456

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

Workorder: 10425111

Workorder Name: 18-00383 MPCA Freeway LF Solid

Owner Received Date: 3/27/2018

Results Requested By: 4/10/2018

Report To		Subcontract To					Requested Analysis																			
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					Fluoride by method 9056																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Preserved Containers				LAB USE ONLY															
1	FD-SB-A2 (10-20 S)	PS	3/27/2018 10:40	10425111001	Solid	1																				
2	FD-SB-B2 (12-21 WM)	PS	3/27/2018 11:15	10425111002	Solid	1																				
3	FD-SB-C2 (5-17 WM)	PS	3/27/2018 13:30	10425111003	Solid	1																				
4	FD-SB-D2 (3-12 WM)	PS	3/27/2018 14:10	10425111004	Solid	1																				
5	FD-SB-E2 (11-21 S)	PS	3/27/2018 15:15	10425111005	Solid	1																				
6	FD-SB-F2 (7-13 WM)	PS	3/27/2018 16:20	10425111006	Solid	1																				
												Comments														
Transfers	Released By	Date/Time	Received By	Date/Time																						
1	<i>[Signature]</i>	3/28/18 1805	<i>[Signature]</i>	3-28-18 1900																						
2	<i>[Signature]</i>	3-28-18 2345	<i>[Signature]</i>	3/29/18 0645																						
3																										
Cooler Temperature on Receipt		3.8 °C	Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N																			

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: MPCA FSD P&SI-MN/FLD Project #: _____

WO# : 12106456
 PM: HRZ Due Date: 04/10/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.5 Cooler Temp Corrected °C: 3.8 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 3-28-18 PS
 Comments: Bm 3/29/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Angela Loisel Date: 3/29/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: Pace Mpls

Project #: **WO#: 12106456**

PM: HRZ Due Date: 04/10/18
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.7 Cooler Temp Corrected °C: 0.7 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: CNH 3/29/18

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Angela Loisel

Date: 3/29/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

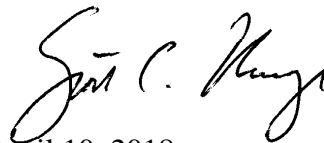
PaceProject#: 10425112
Sample Receipt Date: 03/27/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 10, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 10, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 53-80%. Except for one low value, which was flagged "R" on the results table, the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. In cases where the estimated detection limits (EDLs) were above the standard reporting limits, the EDLs were reported and flagged "A".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 109%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10425112

Appendix A

Sample Management

WO#: 10425112



10425112



Chain-of-Custody Form

Work Order Number

Turnaround Time

Page: 1 of 1

PROJECT/CLIENT INFO

LABORATORY

Facility Code:

Program Code (MDH Lab Only):

Lab Name:

Project Name:

MPCA-Freeway/F50118

Project Task Code:

Address:

18-00383

Project Manager:

EPIC Proj # 38716

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wtr-Ground=Groundwater
Wtr-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	PRESERV.	ANALYSIS		Lab Sample No.	#
													See attached for soils/water (C-Dioxin)	+ Dioxin		
EP-SB-A2 (10-20 S)	S	3/27/18	1040	10	20	C	SD				13		X	X	001	1
EP-SB-B2 (12-21 W)	S	3/27/18	115	12	21	C	SD				13		X	X		2
EP-SB-C2 (5-17 W)	S	3/27/18	1330	5	17	C	SD				13		X	X	002	3
EP-SB-D2 (3-12 W)	S	3/27/18	1410	3	12	C	SD				13		X	X		4
EP-SB-E2 (11-21 S)	S	3/27/18	1515	11	21	C	SD				13		X	X	003	5
EP-SB-F2 (7-13 W)	S	3/27/18	1620	7	13	C	SD				13		X	X		6
																7
																8
																9
																10

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) David Anderson / Price Analytical	3/27/18/1650	Ali Price	3-27-18 1650 2-7°C

Sample Condition Upon Receipt **Client Name:** MPCA FSD **Project #:** _____
Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
Tracking Number: _____

WO#: 10425112
PM: SCU **Due Date: 04/10/18**
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** **Proj. Due Date:** _____ **Proj. Name:** _____
Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No
Thermometer Used: 151401163 G87A9155100842 **Type of Ice:** Wet Blue None Dry Melted
Cooler Temp Read (°C): 2.7 **Cooler Temp Corrected (°C):** 2.9 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** me 3/27/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 3/28/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10425112

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A2 (10-20 S)		
Lab Sample ID	10425112001		
Filename	U180406A_11		
Injected By	ZMS		
Total Amount Extracted	13.1 g	Matrix	Solid
% Moisture	23.0	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	03/27/2018 10:40
ICAL ID	U180405	Received	03/27/2018 16:50
CCal Filename(s)	U180406A_01 & U180406A_15	Extracted	04/02/2018 14:55
Method Blank ID	BLANK-61474	Analyzed	04/06/2018 18:37

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-C2 (5-17 WM)		
Lab Sample ID	10425112002		
Filename	U180406A_12		
Injected By	ZMS		
Total Amount Extracted	14.4 g	Matrix	Solid
% Moisture	30.6	Dilution	NA
Dry Weight Extracted	9.99 g	Collected	03/27/2018 13:30
ICAL ID	U180405	Received	03/27/2018 16:50
CCal Filename(s)	U180406A_01 & U180406A_15	Extracted	04/02/2018 14:55
Method Blank ID	BLANK-61474	Analyzed	04/06/2018 19:25

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	5.0	----	1.5 A	2,3,7,8-TCDD-13C	2.00	44
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	103

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-E2 (11-21 S)		
Lab Sample ID	10425112003		
Filename	U180406A_13		
Injected By	ZMS		
Total Amount Extracted	15.6 g	Matrix	Solid
% Moisture	35.3	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	03/27/2018 15:15
ICAL ID	U180405	Received	03/27/2018 16:50
CCal Filename(s)	U180406A_01 & U180406A_15	Extracted	04/02/2018 14:55
Method Blank ID	BLANK-61474	Analyzed	04/06/2018 20:14

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	53
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61474	Matrix	Solid
Filename	U180406A_10	Dilution	NA
Total Amount Extracted	75.3 g	Extracted	04/02/2018 14:55
ICAL ID	U180405	Analyzed	04/06/2018 17:48
CCal Filename(s)	U180406A_01 & U180406A_15	Injected By	ZMS

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	67

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61475	Matrix	Solid
Filename	U180406A_05	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	04/02/2018 14:55
ICAL ID	U180405	Analyzed	04/06/2018 13:42
CCal Filename(s)	U180406A_01 & U180406A_15	Injected By	
Method Blank ID	BLANK-61474		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.22	109	2,3,7,8-TCDD-13C	2.0	30 R
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	37

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

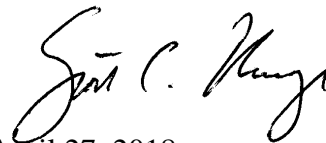
PaceProject#: 10427011
Sample Receipt Date: 04/11/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 27, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 27, 2018

DISCUSSION

This report presents the results from the analyses performed on four samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 57-62%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 104%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management



10427011

Report No.....10427011_8290TCDD

DTA 4/11/18
DTA 4/11/18

Minnesota Pollution Control Agency		Chain-of-Custody Form		Work Order Number: COCT		Turnaround Time:		COC ID:		FOR LAB USE ONLY				
PROJECT/CLIENT INFO						LABORATORY								
Facility Code:		MPCA - Freeway LF Solids				Program Code (MDH Lab Only):		Lab Name:						
Project Name:		MPCA - Freeway LF Solids				Project Task Code:		Address: 18-00383						
Project Manager:								EPIC Profile #38716						
Potential Hazard?		If yes, add information to Sampler Comments Section						Phone No:						
SAMPLE DETAILS						ANALYSIS REQUESTED								
SAMPLE TYPE CODES		LAB MATRIX CODES		FIELD MATRIX CODES		PRESERV.								
Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air BL=Biological Material OT=Other TS=Tissue		Wt-Ground-Groundwater Wt-Surf-Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample						
Location Identifier	Sample Type	Date	Time	Start Depth, meters	End Depth, meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
FD-SB	S	4/11/18				C	SD							1
FD-TF-01 (10-13 W/M)	S	4/11/18	1020			C	SD				13	X X		2 001
FD-TF-02 (7-9 W/M)	S	4/11/18	1220			C	SD				13	X X		3
FD-SB-A1 (3-5 W/M)	S	4/11/18	1300			C	SD				13	X X		4 002
FD-SB-A2	S	4/11/18				C	SD				13	X		5
FD-SB-B1 (11-13 W/M)	S	4/11/18	1350			C	SD				13	X X		6
FD-SB-C1 (5-9 W/M)	S	4/11/18	1430			C	SD				13	X X		7 003
FD-TF-03 (2-5 W/M)	S	4/11/18	1450			C	SD				13	X X		8
FD-SB-D1 (11-16 W/M)	S	4/11/18	1535			C	SD				13	X X		9 004
FD-SB-E1 (10-15 W/M)	S	4/11/18	1610			C	SD				13	X		10
Sampled By: David Anderson		Sampler's Signature: David Anderson				Phone #:								
Receiving Comments:														
Relinquished By/Affiliation					Date/Time		Accepted By/ Affiliation					Date/Time		
David Anderson / Pace Analytical					4/11/18/1650		Nancy Williams / Pace					4/11/18/1650		
Nancy Williams / Pace					4/11/18/1713		Mandy / Pace					4/11/18/1713		

T=6.2

Sample Condition Upon Receipt

Client Name:

Project #:

WO#: 10427011

PM: SCU

Due Date: 04/19/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 6.0 Cooler Temp Corrected (°C): 6.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: SCU 4/11/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (international including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SCU</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>MS 4/11/18</u>	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Scott Wang

Date: 04/12/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately
 half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-01 (10-12 WM)		
Lab Sample ID	10427011001		
Filename	U180422B_04		
Injected By	BAL		
Total Amount Extracted	13.7 g	Matrix	Solid
% Moisture	34.3	Dilution	NA
Dry Weight Extracted	9.00 g	Collected	04/11/2018 10:20
ICAL ID	U180405	Received	04/11/2018 17:13
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 16:41

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	57

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A1 (3-6 S)		
Lab Sample ID	10427011002		
Filename	U180422B_05		
Injected By	BAL		
Total Amount Extracted	15.4 g	Matrix	Solid
% Moisture	31.3	Dilution	NA
Dry Weight Extracted	10.6 g	Collected	04/11/2018 13:00
ICAL ID	U180405	Received	04/11/2018 17:13
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 17:29

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	57
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	57

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-C1 (5-8 WM)		
Lab Sample ID	10427011003		
Filename	U180422B_06		
Injected By	BAL		
Total Amount Extracted	12.5 g	Matrix	Solid
% Moisture	21.5	Dilution	NA
Dry Weight Extracted	9.81 g	Collected	04/11/2018 14:30
ICAL ID	U180405	Received	04/11/2018 17:13
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 18:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.1	----	1.0	2,3,7,8-TCDD-13C	2.00	60
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	60

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-D1 (11-16 WM)		
Lab Sample ID	10427011004		
Filename	U180426A_13		
Injected By	SMT		
Total Amount Extracted	12.6 g	Matrix	Solid
% Moisture	17.3	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	04/11/2018 15:35
ICAL ID	U180405	Received	04/11/2018 17:13
CCal Filename(s)	U180426A_07 & U180426B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/26/2018 13:09

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	62
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61774	Matrix	Solid
Filename	Y180422A_04	Dilution	NA
Total Amount Extracted	79.7 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 16:10
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61775	Matrix	Solid
Filename	Y180422A_01	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 13:59
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL
Method Blank ID	BLANK-61774		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.21	104	2,3,7,8-TCDD-13C	2.0	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 01, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137
 Mississippi Certification #: MN00064
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon NwTPH Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DW Certification #: 9952 C
 West Virginia DEP Certification #: 382
 Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 Montana Certificate #CERT0103
 California Certification #2973
 California Certification #2973
 Alaska Certification UST-107
 Alaska Certification #MN01084
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
 North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007
 Nevada DNR #MN010842018-1
 Oklahoma Department of Environmental Quality
 California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
 Montana DHHS Certification #: CERT0102
 Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
 Wisconsin DNR Certification #: 999446800
 North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
 Florida/NELAP Certification #: E87948
 Illinois Certification #: 200050
 Kentucky UST Certification #: 82
 Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
 New York Certification #: 12064
 North Dakota Certification #: R-150
 Virginia VELAP ID: 460263
 South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427018001	FD-TT-01 (10-12 WM)	Solid	04/11/18 10:20	04/11/18 17:13
10427018002	FD-TT-02 (7-9 WM)	Solid	04/11/18 12:20	04/11/18 17:13
10427018003	FD-SB-A1 (3-6 S)	Solid	04/11/18 13:00	04/11/18 17:13
10427018004	FD-SB-B1 (11-13 WM)	Solid	04/11/18 13:50	04/11/18 17:13
10427018005	FD-SB-C1 (5-8 WM)	Solid	04/11/18 14:30	04/11/18 17:13
10427018006	FD-TT-03 (2-5 WM)	Solid	04/11/18 14:50	04/11/18 17:13
10427018007	FD-SB-D1 (11-16 WM)	Solid	04/11/18 15:35	04/11/18 17:13
10427018008	FD-SB-E1 (10-15 WM)	Solid	04/11/18 16:10	04/11/18 17:13

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427018001	FD-TT-01 (10-12 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	EC2	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427018002	FD-TT-02 (7-9 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	EC2			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427018003	FD-SB-A1 (3-6 S)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018004	FD-SB-B1 (11-13 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018005	FD-SB-C1 (5-8 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018006	FD-TT-03 (2-5 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018007	FD-SB-D1 (11-16 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427018008	FD-SB-E1 (10-15 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) **Lab ID: 10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.9	1	04/25/18 10:56	04/27/18 14:40	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	309-00-2	
alpha-BHC	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	319-84-6	
beta-BHC	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	319-85-7	
delta-BHC	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	58-89-9	
Chlordane (Technical)	ND	ug/kg	254	10	04/16/18 09:32	04/16/18 21:53	57-74-9	
alpha-Chlordane	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	5103-71-9	
gamma-Chlordane	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	5103-74-2	
4,4'-DDD	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	72-54-8	
4,4'-DDE	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	72-55-9	
4,4'-DDT	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	50-29-3	
Dieldrin	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	60-57-1	
Endosulfan I	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	959-98-8	
Endosulfan II	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	33213-65-9	
Endosulfan sulfate	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	1031-07-8	
Endrin	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	72-20-8	
Endrin aldehyde	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	7421-93-4	
Endrin ketone	ND	ug/kg	50.6	10	04/16/18 09:32	04/16/18 21:53	53494-70-5	
Heptachlor	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	76-44-8	
Heptachlor epoxide	ND	ug/kg	25.4	10	04/16/18 09:32	04/16/18 21:53	1024-57-3	
Methoxychlor	ND	ug/kg	254	10	04/16/18 09:32	04/16/18 21:53	72-43-5	
Toxaphene	ND	ug/kg	760	10	04/16/18 09:32	04/16/18 21:53	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	04/16/18 09:32	04/16/18 21:53	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	10	04/16/18 09:32	04/16/18 21:53	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11141-16-5	
PCB-1242 (Aroclor 1242)	746	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	12672-29-6	
PCB-1254 (Aroclor 1254)	118	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	11100-14-4	
PCB, Total	864	ug/kg	77.0	1	04/13/18 19:35	04/16/18 16:02	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	89	%	48-125	1	04/13/18 19:35	04/16/18 16:02	877-09-8	
Decachlorobiphenyl (S)	81	%	30-134	1	04/13/18 19:35	04/16/18 16:02	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) **Lab ID: 10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1420	mg/kg	119	10	04/12/18 14:19	04/13/18 12:36		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/12/18 14:19	04/13/18 12:36	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	22.8	mg/kg	16.2	1	04/23/18 09:23	04/23/18 17:21		C0,M1
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/23/18 09:23	04/23/18 17:21	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9190	mg/kg	14.4	1	04/13/18 05:02	04/13/18 15:28	7429-90-5	
Barium	344	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:28	7440-39-3	
Boron	134	mg/kg	10.8	1	04/13/18 05:02	04/13/18 15:28	7440-42-8	
Copper	36.7	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:28	7440-50-8	
Iron	36800	mg/kg	18.0	5	04/13/18 05:02	04/13/18 15:50	7439-89-6	
Manganese	291	mg/kg	0.36	1	04/13/18 05:02	04/13/18 15:28	7439-96-5	
Nickel	43.1	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:28	7440-02-0	
Silver	ND	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:28	7440-22-4	
Tin	20.1	mg/kg	5.4	1	04/13/18 05:02	04/13/18 15:28	7440-31-5	
Titanium	415	mg/kg	1.8	1	04/13/18 05:02	04/13/18 15:28	7440-32-6	
Zinc	1460	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:28	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	33.3	mg/kg	1.4	5	04/18/18 10:36	04/19/18 06:58	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.3	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7440-36-0	
Arsenic	11.6	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7440-38-2	
Beryllium	1.5	mg/kg	0.29	20	04/13/18 05:01	04/13/18 09:24	7440-41-7	
Cadmium	2.3	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:24	7440-43-9	
Cobalt	5.6	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7440-48-4	
Lead	150	mg/kg	0.14	20	04/13/18 05:01	04/13/18 09:24	7439-92-1	
Lithium	6.5	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7439-93-2	
Selenium	2.9	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7782-49-2	
Strontium	56.3	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:24	7440-24-6	
Vanadium	132	mg/kg	1.4	20	04/13/18 05:01	04/13/18 09:24	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.14	mg/kg	0.026	1	04/13/18 05:02	04/15/18 18:03	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	34.3	%	0.10	1		04/18/18 12:40		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	5010	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-TT-01 (10-12 WM)** Lab ID: **10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	208-96-8	
Anthracene	15400	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	120-12-7	
Benzo(a)anthracene	41400	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	56-55-3	
Benzo(a)pyrene	36300	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	205-99-2	
Benzo(g,h,i)perylene	24800	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	191-24-2	
Benzo(k)fluoranthene	18300	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	101-55-3	
Butylbenzylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	85-68-7	
Carbazole	3270	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	59-50-7	
4-Chloroaniline	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	108-60-1	
2-Chloronaphthalene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	91-58-7	
2-Chlorophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	7005-72-3	
Chrysene	46400	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	218-01-9	
Dibenz(a,h)anthracene	1920	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	53-70-3	
Dibenzofuran	2930	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	120-83-2	
Diethylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	105-67-9	
Dimethylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	131-11-3	
Di-n-butylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2580	1	04/13/18 17:55	04/19/18 19:42	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	606-20-2	
Di-n-octylphthalate	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	122-66-7	
bis(2-Ethylhexyl)phthalate	2000	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	117-81-7	
Fluoranthene	107000	ug/kg	10000	20	04/13/18 17:55	04/20/18 16:00	206-44-0	
Fluorene	5970	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	87-68-3	
Hexachlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	118-74-1	
Hexachloroethane	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	67-72-1	
Indeno(1,2,3-cd)pyrene	21800	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	193-39-5	
Isophorone	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	78-59-1	
1-Methylnaphthalene	642	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	90-12-0	
2-Methylnaphthalene	746	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) **Lab ID: 10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1000	1	04/13/18 17:55	04/19/18 19:42		
Naphthalene	614	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	91-20-3	
2-Nitroaniline	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	88-74-4	
3-Nitroaniline	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	99-09-2	
4-Nitroaniline	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	100-01-6	
Nitrobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	98-95-3	
2-Nitrophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	88-75-5	
4-Nitrophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	86-30-6	
Pentachlorophenol	ND	ug/kg	1020	1	04/13/18 17:55	04/19/18 19:42	87-86-5	
Phenanthrene	76800	ug/kg	5020	10	04/13/18 17:55	04/19/18 20:15	85-01-8	
Phenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	108-95-2	
Pyrene	96700	ug/kg	10000	20	04/13/18 17:55	04/20/18 16:00	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	502	1	04/13/18 17:55	04/19/18 19:42	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	63	%	43-125	1	04/13/18 17:55	04/19/18 19:42	4165-60-0	
2-Fluorobiphenyl (S)	64	%	30-132	1	04/13/18 17:55	04/19/18 19:42	321-60-8	
p-Terphenyl-d14 (S)	118	%	62-125	1	04/13/18 17:55	04/19/18 19:42	1718-51-0	
Phenol-d6 (S)	73	%	48-125	1	04/13/18 17:55	04/19/18 19:42	13127-88-3	
2-Fluorophenol (S)	69	%	40-125	1	04/13/18 17:55	04/19/18 19:42	367-12-4	
2,4,6-Tribromophenol (S)	80	%	60-125	1	04/13/18 17:55	04/19/18 19:42	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	185	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	83-32-9	
Acenaphthylene	ND	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	208-96-8	
Anthracene	351	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	120-12-7	
Benzo(a)anthracene	750	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	56-55-3	
Benzo(a)pyrene	769	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	50-32-8	
Benzo(b)fluoranthene	1100	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	205-99-2	
Benzo(g,h,i)perylene	399	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	191-24-2	
Benzo(k)fluoranthene	354	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	207-08-9	
Chrysene	757	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	218-01-9	
Dibenz(a,h)anthracene	130	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	53-70-3	
Fluoranthene	1770	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	206-44-0	
Fluorene	192	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	86-73-7	
Indeno(1,2,3-cd)pyrene	411	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	193-39-5	
Naphthalene	96.9	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	91-20-3	
Phenanthrene	1350	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	85-01-8	
Pyrene	1450	ug/kg	76.0	5	04/12/18 11:52	04/16/18 21:30	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%	42-125	5	04/12/18 11:52	04/16/18 21:30	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) **Lab ID: 10427018001** Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	100	%	57-125	5	04/12/18 11:52	04/16/18 21:30	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1690	1	04/20/18 10:36	04/21/18 06:07	67-64-1	
Allyl chloride	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	107-05-1	
Benzene	ND	ug/kg	33.8	1	04/20/18 10:36	04/21/18 06:07	71-43-2	
Bromobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	108-86-1	
Bromochloromethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	74-97-5	
Bromodichloromethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	75-27-4	
Bromoform	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	75-25-2	
Bromomethane	ND	ug/kg	845	1	04/20/18 10:36	04/21/18 06:07	74-83-9	
2-Butanone (MEK)	ND	ug/kg	422	1	04/20/18 10:36	04/21/18 06:07	78-93-3	
n-Butylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	104-51-8	
sec-Butylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	135-98-8	
tert-Butylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	98-06-6	
Carbon tetrachloride	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	56-23-5	
Chlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	108-90-7	
Chloroethane	ND	ug/kg	845	1	04/20/18 10:36	04/21/18 06:07	75-00-3	
Chloroform	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	67-66-3	
Chloromethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	74-87-3	
2-Chlorotoluene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	95-49-8	
4-Chlorotoluene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	845	1	04/20/18 10:36	04/21/18 06:07	96-12-8	
Dibromochloromethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	106-93-4	
Dibromomethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	75-71-8	
1,1-Dichloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	75-34-3	
1,2-Dichloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	107-06-2	
1,1-Dichloroethene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	156-60-5	
Dichlorofluoromethane	ND	ug/kg	845	1	04/20/18 10:36	04/21/18 06:07	75-43-4	
1,2-Dichloropropane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	78-87-5	
1,3-Dichloropropane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	142-28-9	
2,2-Dichloropropane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	594-20-7	
1,1-Dichloropropene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	60-29-7	
Ethylbenzene	147	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	422	1	04/20/18 10:36	04/21/18 06:07	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-01 (10-12 WM) Lab ID: 10427018001 Collected: 04/11/18 10:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	98-82-8	
p-Isopropyltoluene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	99-87-6	
Methylene Chloride	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	422	1	04/20/18 10:36	04/21/18 06:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	1634-04-4	
Naphthalene	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	91-20-3	
n-Propylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	103-65-1	
Styrene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	79-34-5	
Tetrachloroethene	98.0	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	127-18-4	
Tetrahydrofuran	ND	ug/kg	3380	1	04/20/18 10:36	04/21/18 06:07	109-99-9	
Toluene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	79-00-5	
Trichloroethene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	79-01-6	
Trichlorofluoromethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	338	1	04/20/18 10:36	04/21/18 06:07	76-13-1	
1,2,4-Trimethylbenzene	415	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	84.5	1	04/20/18 10:36	04/21/18 06:07	108-67-8	
Vinyl chloride	ND	ug/kg	33.8	1	04/20/18 10:36	04/21/18 06:07	75-01-4	
Xylene (Total)	ND	ug/kg	253	1	04/20/18 10:36	04/21/18 06:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/20/18 10:36	04/21/18 06:07	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/20/18 10:36	04/21/18 06:07	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125	1	04/20/18 10:36	04/21/18 06:07	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	61.4	20	04/18/18 10:45	04/19/18 13:48	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	33.3	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.48	1	04/20/18 10:25	04/20/18 13:36	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.7	mg/kg	0.98	1	04/17/18 12:00	04/17/18 21:25	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID: 10427018002** Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	15.2	1	04/25/18 10:56	04/27/18 14:47	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	309-00-2	
alpha-BHC	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	319-84-6	
beta-BHC	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	319-85-7	
delta-BHC	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	58-89-9	
Chlordane (Technical)	ND	ug/kg	56.3	2	04/16/18 09:32	04/16/18 23:42	57-74-9	
alpha-Chlordane	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	5103-71-9	
gamma-Chlordane	5.6	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	5103-74-2	
4,4'-DDD	28.3	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	72-54-8	
4,4'-DDE	17.0	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	72-55-9	
4,4'-DDT	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	50-29-3	
Dieldrin	24.0	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	60-57-1	
Endosulfan I	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	959-98-8	
Endosulfan II	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	33213-65-9	
Endosulfan sulfate	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	1031-07-8	
Endrin	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	72-20-8	
Endrin aldehyde	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	7421-93-4	
Endrin ketone	ND	ug/kg	11.2	2	04/16/18 09:32	04/16/18 23:42	53494-70-5	
Heptachlor	ND	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	76-44-8	
Heptachlor epoxide	29.8	ug/kg	5.6	2	04/16/18 09:32	04/16/18 23:42	1024-57-3	
Methoxychlor	ND	ug/kg	56.3	2	04/16/18 09:32	04/16/18 23:42	72-43-5	
Toxaphene	ND	ug/kg	169	2	04/16/18 09:32	04/16/18 23:42	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	88	%	30-150	2	04/16/18 09:32	04/16/18 23:42	877-09-8	5M, D4
Decachlorobiphenyl (S)	87	%	30-150	2	04/16/18 09:32	04/16/18 23:42	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11141-16-5	
PCB-1242 (Aroclor 1242)	7850	ug/kg	277	5	04/13/18 19:35	04/17/18 09:01	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	12672-29-6	
PCB-1254 (Aroclor 1254)	1190	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	55.5	1	04/13/18 19:35	04/16/18 16:18	11100-14-4	
PCB, Total	9040	ug/kg	277	5	04/13/18 19:35	04/17/18 09:01	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/13/18 19:35	04/16/18 16:18	877-09-8	
Decachlorobiphenyl (S)	79	%	30-134	1	04/13/18 19:35	04/16/18 16:18	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	155	mg/kg	79.0	5	04/12/18 14:19	04/13/18 15:11		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID:** 10427018002 Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	86	%	50-150	5	04/12/18 14:19	04/13/18 15:11	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	20.4	1	04/23/18 09:23	04/23/18 23:23		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/23/18 09:23	04/23/18 23:23	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9140	mg/kg	16.5	1	04/13/18 05:02	04/13/18 15:31	7429-90-5	
Barium	200	mg/kg	0.83	1	04/13/18 05:02	04/13/18 15:31	7440-39-3	
Boron	114	mg/kg	12.4	1	04/13/18 05:02	04/13/18 15:31	7440-42-8	
Copper	166	mg/kg	0.83	1	04/13/18 05:02	04/13/18 15:31	7440-50-8	
Iron	116000	mg/kg	41.3	10	04/13/18 05:02	04/13/18 16:17	7439-89-6	
Manganese	868	mg/kg	2.1	5	04/13/18 05:02	04/13/18 16:00	7439-96-5	
Nickel	57.6	mg/kg	1.7	1	04/13/18 05:02	04/13/18 15:31	7440-02-0	
Silver	0.94	mg/kg	0.83	1	04/13/18 05:02	04/13/18 15:31	7440-22-4	
Tin	190	mg/kg	6.2	1	04/13/18 05:02	04/13/18 15:31	7440-31-5	
Titanium	311	mg/kg	2.1	1	04/13/18 05:02	04/13/18 15:31	7440-32-6	
Zinc	1010	mg/kg	1.7	1	04/13/18 05:02	04/13/18 15:31	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	133	mg/kg	1.6	5	04/18/18 10:36	04/19/18 07:02	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	13.3	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7440-36-0	
Arsenic	22.8	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7440-38-2	
Beryllium	0.69	mg/kg	0.32	20	04/13/18 05:01	04/13/18 09:27	7440-41-7	
Cadmium	2.5	mg/kg	0.13	20	04/13/18 05:01	04/13/18 09:27	7440-43-9	
Cobalt	10.1	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7440-48-4	
Lead	578	mg/kg	0.16	20	04/13/18 05:01	04/13/18 09:27	7439-92-1	
Lithium	4.0	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7439-93-2	
Selenium	1.2	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7782-49-2	
Strontium	48.6	mg/kg	0.80	20	04/13/18 05:01	04/13/18 09:27	7440-24-6	
Vanadium	44.9	mg/kg	1.6	20	04/13/18 05:01	04/13/18 09:27	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	1.1	mg/kg	0.032	1	04/13/18 05:02	04/15/18 18:09	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	40.7	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	83-32-9	
Acenaphthylene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID: 10427018002** Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	120-12-7	
Benzo(a)anthracene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	56-55-3	
Benzo(a)pyrene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	101-55-3	
Butylbenzylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	85-68-7	
Carbazole	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	59-50-7	
4-Chloroaniline	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	108-60-1	
2-Chloronaphthalene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	91-58-7	
2-Chlorophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	7005-72-3	
Chrysene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	53-70-3	
Dibenzofuran	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	120-83-2	
Diethylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	105-67-9	
Dimethylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	131-11-3	
Di-n-butylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2860	1	04/13/18 17:55	04/19/18 19:46	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	606-20-2	
Di-n-octylphthalate	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	122-66-7	
bis(2-Ethylhexyl)phthalate	1020	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	117-81-7	
Fluoranthene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	206-44-0	
Fluorene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	87-68-3	
Hexachlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	118-74-1	
Hexachloroethane	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	193-39-5	
Isophorone	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	78-59-1	
1-Methylnaphthalene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	90-12-0	
2-Methylnaphthalene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID: 10427018002** Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1110	1	04/13/18 17:55	04/19/18 19:46		
Naphthalene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	91-20-3	
2-Nitroaniline	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	88-74-4	
3-Nitroaniline	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	99-09-2	
4-Nitroaniline	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	100-01-6	
Nitrobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	98-95-3	
2-Nitrophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	88-75-5	
4-Nitrophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	86-30-6	
Pentachlorophenol	ND	ug/kg	1130	1	04/13/18 17:55	04/19/18 19:46	87-86-5	
Phenanthrene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	85-01-8	
Phenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	108-95-2	
Pyrene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	556	1	04/13/18 17:55	04/19/18 19:46	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/13/18 17:55	04/19/18 19:46	4165-60-0	
2-Fluorobiphenyl (S)	47	%.	30-132	1	04/13/18 17:55	04/19/18 19:46	321-60-8	
p-Terphenyl-d14 (S)	80	%.	62-125	1	04/13/18 17:55	04/19/18 19:46	1718-51-0	
Phenol-d6 (S)	66	%.	48-125	1	04/13/18 17:55	04/19/18 19:46	13127-88-3	
2-Fluorophenol (S)	62	%.	40-125	1	04/13/18 17:55	04/19/18 19:46	367-12-4	
2,4,6-Tribromophenol (S)	58	%.	60-125	1	04/13/18 17:55	04/19/18 19:46	118-79-6	S5

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	83-32-9	
Acenaphthylene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	208-96-8	
Anthracene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	120-12-7	
Benzo(a)anthracene	67.3	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	56-55-3	
Benzo(a)pyrene	75.2	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	50-32-8	
Benzo(b)fluoranthene	452	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	205-99-2	
Benzo(g,h,i)perylene	196	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	191-24-2	
Benzo(k)fluoranthene	133	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	207-08-9	
Chrysene	178	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	218-01-9	
Dibenz(a,h)anthracene	81.8	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	53-70-3	
Fluoranthene	38.8	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	206-44-0	
Fluorene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	86-73-7	
Indeno(1,2,3-cd)pyrene	183	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	193-39-5	
Naphthalene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	91-20-3	
Phenanthrene	ND	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	85-01-8	
Pyrene	43.2	ug/kg	33.7	2	04/12/18 11:52	04/17/18 12:15	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%.	42-125	2	04/12/18 11:52	04/17/18 12:15	321-60-8	D3
p-Terphenyl-d14 (S)	98	%.	57-125	2	04/12/18 11:52	04/17/18 12:15	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) Lab ID: 10427018002 Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1880	1	04/21/18 11:05	04/21/18 21:21	67-64-1	
Allyl chloride	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	107-05-1	
Benzene	ND	ug/kg	37.6	1	04/21/18 11:05	04/21/18 21:21	71-43-2	
Bromobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	108-86-1	
Bromochloromethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	74-97-5	
Bromodichloromethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	75-27-4	
Bromoform	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	75-25-2	
Bromomethane	ND	ug/kg	940	1	04/21/18 11:05	04/21/18 21:21	74-83-9	
2-Butanone (MEK)	ND	ug/kg	470	1	04/21/18 11:05	04/21/18 21:21	78-93-3	
n-Butylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	104-51-8	
sec-Butylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	135-98-8	
tert-Butylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	98-06-6	
Carbon tetrachloride	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	56-23-5	
Chlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	108-90-7	
Chloroethane	ND	ug/kg	940	1	04/21/18 11:05	04/21/18 21:21	75-00-3	
Chloroform	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	67-66-3	
Chloromethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	74-87-3	
2-Chlorotoluene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	95-49-8	
4-Chlorotoluene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	940	1	04/21/18 11:05	04/21/18 21:21	96-12-8	
Dibromochloromethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	106-93-4	
Dibromomethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	75-71-8	
1,1-Dichloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	75-34-3	
1,2-Dichloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	107-06-2	
1,1-Dichloroethene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	156-60-5	
Dichlorofluoromethane	ND	ug/kg	940	1	04/21/18 11:05	04/21/18 21:21	75-43-4	
1,2-Dichloropropane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	78-87-5	
1,3-Dichloropropane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	142-28-9	
2,2-Dichloropropane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	594-20-7	
1,1-Dichloropropene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	60-29-7	
Ethylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	470	1	04/21/18 11:05	04/21/18 21:21	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	98-82-8	
p-Isopropyltoluene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	99-87-6	
Methylene Chloride	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	470	1	04/21/18 11:05	04/21/18 21:21	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-02 (7-9 WM) **Lab ID:** 10427018002 Collected: 04/11/18 12:20 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	1634-04-4	
Naphthalene	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	91-20-3	
n-Propylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	103-65-1	
Styrene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	79-34-5	
Tetrachloroethene	122	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	127-18-4	
Tetrahydrofuran	ND	ug/kg	3760	1	04/21/18 11:05	04/21/18 21:21	109-99-9	
Toluene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	79-00-5	
Trichloroethene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	79-01-6	
Trichlorofluoromethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	376	1	04/21/18 11:05	04/21/18 21:21	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	94.0	1	04/21/18 11:05	04/21/18 21:21	108-67-8	
Vinyl chloride	ND	ug/kg	37.6	1	04/21/18 11:05	04/21/18 21:21	75-01-4	
Xylene (Total)	ND	ug/kg	282	1	04/21/18 11:05	04/21/18 21:21	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/21/18 11:05	04/21/18 21:21	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	04/21/18 11:05	04/21/18 21:21	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	04/21/18 11:05	04/21/18 21:21	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	67.5	20	04/18/18 10:45	04/19/18 13:48	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	133	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	1.2	mg/kg	0.44	1	04/20/18 10:25	04/20/18 13:37	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.8	mg/kg	0.98	1	04/17/18 12:00	04/18/18 02:38	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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1630 Methyl Mercury

Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)

Methyl Mercury	ND	ng/g	13.6	1	04/25/18 10:56	04/27/18 14:54	7439-97-6	N3
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8081B GCS Pesticides

Analytical Method: EPA 8081B Preparation Method: EPA 3550

Aldrin	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	309-00-2	
alpha-BHC	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	319-84-6	
beta-BHC	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	319-85-7	
delta-BHC	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	58-89-9	
Chlordane (Technical)	ND	ug/kg	24.2	1	04/16/18 09:32	04/17/18 00:19	57-74-9	
alpha-Chlordane	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	5103-74-2	
4,4'-DDD	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	72-54-8	
4,4'-DDE	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	72-55-9	
4,4'-DDT	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	50-29-3	
Dieldrin	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	60-57-1	
Endosulfan I	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	959-98-8	
Endosulfan II	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	33213-65-9	
Endosulfan sulfate	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	1031-07-8	
Endrin	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	72-20-8	
Endrin aldehyde	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	7421-93-4	
Endrin ketone	ND	ug/kg	4.8	1	04/16/18 09:32	04/17/18 00:19	53494-70-5	
Heptachlor	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.4	1	04/16/18 09:32	04/17/18 00:19	1024-57-3	
Methoxychlor	ND	ug/kg	24.2	1	04/16/18 09:32	04/17/18 00:19	72-43-5	
Toxaphene	ND	ug/kg	72.6	1	04/16/18 09:32	04/17/18 00:19	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	30-150	1	04/16/18 09:32	04/17/18 00:19	877-09-8	
Decachlorobiphenyl (S)	80	%	30-150	1	04/16/18 09:32	04/17/18 00:19	2051-24-3	

8082A GCS PCB

Analytical Method: EPA 8082A Preparation Method: EPA 3550

PCB-1016 (Aroclor 1016)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	11100-14-4	
PCB, Total	ND	ug/kg	47.9	1	04/13/18 19:35	04/16/18 16:33	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/13/18 19:35	04/16/18 16:33	877-09-8	
Decachlorobiphenyl (S)	89	%	30-134	1	04/13/18 19:35	04/16/18 16:33	2051-24-3	

WIDRO GCS

Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO

WDRO C10-C28	ND	mg/kg	12.3	1	04/12/18 14:19	04/13/18 13:32		
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	74	%	50-150	1	04/12/18 14:19	04/13/18 13:32	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.1	1	04/23/18 09:23	04/23/18 15:18		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/23/18 09:23	04/23/18 15:18	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8780	mg/kg	14.4	1	04/13/18 05:02	04/13/18 15:34	7429-90-5	
Barium	100	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:34	7440-39-3	
Boron	265	mg/kg	10.8	1	04/13/18 05:02	04/13/18 15:34	7440-42-8	
Copper	18.0	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:34	7440-50-8	
Iron	23000	mg/kg	18.0	5	04/13/18 05:02	04/13/18 16:03	7439-89-6	
Manganese	159	mg/kg	0.36	1	04/13/18 05:02	04/13/18 15:34	7439-96-5	
Nickel	41.6	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:34	7440-02-0	
Silver	ND	mg/kg	0.72	1	04/13/18 05:02	04/13/18 15:34	7440-22-4	
Tin	ND	mg/kg	5.4	1	04/13/18 05:02	04/13/18 15:34	7440-31-5	
Titanium	472	mg/kg	1.8	1	04/13/18 05:02	04/13/18 15:34	7440-32-6	
Zinc	127	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:34	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	43.5	mg/kg	1.4	5	04/18/18 10:36	04/19/18 07:07	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7440-36-0	
Arsenic	21.7	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7440-38-2	
Beryllium	3.1	mg/kg	0.29	20	04/13/18 05:01	04/13/18 09:30	7440-41-7	
Cadmium	1.9	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:30	7440-43-9	
Cobalt	6.9	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7440-48-4	
Lead	31.3	mg/kg	0.14	20	04/13/18 05:01	04/13/18 09:30	7439-92-1	
Lithium	10.2	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7439-93-2	
Selenium	2.2	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7782-49-2	
Strontium	57.0	mg/kg	0.72	20	04/13/18 05:01	04/13/18 09:30	7440-24-6	
Vanadium	224	mg/kg	1.4	20	04/13/18 05:01	04/13/18 09:30	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.028	1	04/13/18 05:02	04/15/18 18:11	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	31.3	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	83-32-9	
Acenaphthylene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-SB-A1 (3-6 S)** Lab ID: **10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	120-12-7	
Benzo(a)anthracene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	56-55-3	
Benzo(a)pyrene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	101-55-3	
Butylbenzylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	85-68-7	
Carbazole	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	59-50-7	
4-Chloroaniline	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	108-60-1	
2-Chloronaphthalene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	91-58-7	
2-Chlorophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	7005-72-3	
Chrysene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	53-70-3	
Dibenzofuran	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	120-83-2	
Diethylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	105-67-9	
Dimethylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	131-11-3	
Di-n-butylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2470	1	04/20/18 12:55	04/24/18 15:00	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	606-20-2	
Di-n-octylphthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	117-81-7	
Fluoranthene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	206-44-0	
Hexachloro-1,3-butadiene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	87-68-3	
Hexachlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	118-74-1	
Hexachloroethane	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	193-39-5	
Isophorone	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	78-59-1	
1-Methylnaphthalene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	90-12-0	
2-Methylnaphthalene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-SB-A1 (3-6 S)** Lab ID: **10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	959	1	04/20/18 12:55	04/24/18 15:00		
Naphthalene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	91-20-3	
2-Nitroaniline	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	88-74-4	
3-Nitroaniline	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	99-09-2	
4-Nitroaniline	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	100-01-6	
Nitrobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	98-95-3	
2-Nitrophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	88-75-5	
4-Nitrophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	86-30-6	
Pentachlorophenol	ND	ug/kg	974	1	04/20/18 12:55	04/24/18 15:00	87-86-5	
Phenanthrene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	85-01-8	
Phenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	108-95-2	
Pyrene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	480	1	04/20/18 12:55	04/24/18 15:00	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	55	%	43-125	1	04/20/18 12:55	04/24/18 15:00	4165-60-0	
2-Fluorobiphenyl (S)	54	%	30-132	1	04/20/18 12:55	04/24/18 15:00	321-60-8	
p-Terphenyl-d14 (S)	86	%	62-125	1	04/20/18 12:55	04/24/18 15:00	1718-51-0	
Phenol-d6 (S)	57	%	48-125	1	04/20/18 12:55	04/24/18 15:00	13127-88-3	
2-Fluorophenol (S)	56	%	40-125	1	04/20/18 12:55	04/24/18 15:00	367-12-4	
2,4,6-Tribromophenol (S)	68	%	60-125	1	04/20/18 12:55	04/24/18 15:00	118-79-6	
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	83-32-9	
Acenaphthylene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	208-96-8	
Anthracene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	120-12-7	
Benzo(a)anthracene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	50-32-8	
Benzo(b)fluoranthene	15.9	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	207-08-9	
Chrysene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	53-70-3	
Fluoranthene	39.4	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	206-44-0	
Fluorene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	193-39-5	
Naphthalene	ND	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	91-20-3	
Phenanthrene	22.0	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	85-01-8	
Pyrene	29.6	ug/kg	14.5	1	04/12/18 11:52	04/16/18 19:07	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	58	%	42-125	1	04/12/18 11:52	04/16/18 19:07	321-60-8	
p-Terphenyl-d14 (S)	90	%	57-125	1	04/12/18 11:52	04/16/18 19:07	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1450	1	04/21/18 11:05	04/21/18 21:37	67-64-1	
Allyl chloride	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	107-05-1	
Benzene	ND	ug/kg	29.0	1	04/21/18 11:05	04/21/18 21:37	71-43-2	
Bromobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	108-86-1	
Bromochloromethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	74-97-5	
Bromodichloromethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	75-27-4	
Bromoform	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	75-25-2	
Bromomethane	ND	ug/kg	725	1	04/21/18 11:05	04/21/18 21:37	74-83-9	
2-Butanone (MEK)	ND	ug/kg	362	1	04/21/18 11:05	04/21/18 21:37	78-93-3	
n-Butylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	104-51-8	
sec-Butylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	135-98-8	
tert-Butylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	98-06-6	
Carbon tetrachloride	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	56-23-5	
Chlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	108-90-7	
Chloroethane	ND	ug/kg	725	1	04/21/18 11:05	04/21/18 21:37	75-00-3	
Chloroform	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	67-66-3	
Chloromethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	74-87-3	
2-Chlorotoluene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	95-49-8	
4-Chlorotoluene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	725	1	04/21/18 11:05	04/21/18 21:37	96-12-8	
Dibromochloromethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	106-93-4	
Dibromomethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	75-71-8	
1,1-Dichloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	75-34-3	
1,2-Dichloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	107-06-2	
1,1-Dichloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	156-60-5	
Dichlorofluoromethane	ND	ug/kg	725	1	04/21/18 11:05	04/21/18 21:37	75-43-4	
1,2-Dichloropropane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	78-87-5	
1,3-Dichloropropane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	142-28-9	
2,2-Dichloropropane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	594-20-7	
1,1-Dichloropropene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	60-29-7	
Ethylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	362	1	04/21/18 11:05	04/21/18 21:37	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	98-82-8	
p-Isopropyltoluene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	99-87-6	
Methylene Chloride	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	362	1	04/21/18 11:05	04/21/18 21:37	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-A1 (3-6 S) **Lab ID: 10427018003** Collected: 04/11/18 13:00 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	1634-04-4	
Naphthalene	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	91-20-3	
n-Propylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	103-65-1	
Styrene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	79-34-5	
Tetrachloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	127-18-4	
Tetrahydrofuran	ND	ug/kg	2900	1	04/21/18 11:05	04/21/18 21:37	109-99-9	
Toluene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	79-00-5	
Trichloroethene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	79-01-6	
Trichlorofluoromethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	290	1	04/21/18 11:05	04/21/18 21:37	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	72.5	1	04/21/18 11:05	04/21/18 21:37	108-67-8	
Vinyl chloride	ND	ug/kg	29.0	1	04/21/18 11:05	04/21/18 21:37	75-01-4	
Xylene (Total)	ND	ug/kg	217	1	04/21/18 11:05	04/21/18 21:37	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/21/18 11:05	04/21/18 21:37	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/21/18 11:05	04/21/18 21:37	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	04/21/18 11:05	04/21/18 21:37	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.4	5	04/18/18 10:45	04/19/18 13:49	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	43.5	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.49	1	04/20/18 10:25	04/20/18 13:37	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	4.6	mg/kg	1.0	1	04/18/18 14:45	04/20/18 03:00	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) Lab ID: 10427018004 Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.8	1	04/25/18 10:56	04/27/18 15:00	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	309-00-2	
alpha-BHC	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	319-84-6	
beta-BHC	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	319-85-7	
delta-BHC	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	58-89-9	
Chlordane (Technical)	ND	ug/kg	97.6	5	04/16/18 09:32	04/16/18 23:24	57-74-9	
alpha-Chlordane	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	5103-71-9	
gamma-Chlordane	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	5103-74-2	
4,4'-DDD	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	72-54-8	
4,4'-DDE	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	72-55-9	
4,4'-DDT	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	50-29-3	
Dieldrin	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	60-57-1	
Endosulfan I	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	959-98-8	
Endosulfan II	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	33213-65-9	
Endosulfan sulfate	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	1031-07-8	
Endrin	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	72-20-8	
Endrin aldehyde	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	7421-93-4	
Endrin ketone	ND	ug/kg	19.5	5	04/16/18 09:32	04/16/18 23:24	53494-70-5	
Heptachlor	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	76-44-8	
Heptachlor epoxide	ND	ug/kg	9.8	5	04/16/18 09:32	04/16/18 23:24	1024-57-3	
Methoxychlor	ND	ug/kg	97.6	5	04/16/18 09:32	04/16/18 23:24	72-43-5	
Toxaphene	ND	ug/kg	292	5	04/16/18 09:32	04/16/18 23:24	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	91	%	30-150	5	04/16/18 09:32	04/16/18 23:24	877-09-8	3M, D3
Decachlorobiphenyl (S)	100	%	30-150	5	04/16/18 09:32	04/16/18 23:24	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	11100-14-4	
PCB, Total	ND	ug/kg	38.7	1	04/13/18 19:35	04/16/18 16:49	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	78	%	48-125	1	04/13/18 19:35	04/16/18 16:49	877-09-8	
Decachlorobiphenyl (S)	80	%	30-134	1	04/13/18 19:35	04/16/18 16:49	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	186	mg/kg	100	10	04/12/18 14:19	04/13/18 15:04		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) Lab ID: 10427018004 Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/12/18 14:19	04/13/18 15:04	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	17.7	mg/kg	15.7	1	04/23/18 09:23	04/23/18 23:47		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/23/18 09:23	04/23/18 23:47	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4620	mg/kg	11.3	1	04/13/18 05:02	04/13/18 15:36	7429-90-5	
Barium	72.7	mg/kg	0.56	1	04/13/18 05:02	04/13/18 15:36	7440-39-3	
Boron	12.6	mg/kg	8.5	1	04/13/18 05:02	04/13/18 15:36	7440-42-8	
Copper	12.5	mg/kg	0.56	1	04/13/18 05:02	04/13/18 15:36	7440-50-8	
Iron	9730	mg/kg	2.8	1	04/13/18 05:02	04/13/18 15:36	7439-89-6	
Manganese	238	mg/kg	0.28	1	04/13/18 05:02	04/13/18 15:36	7439-96-5	
Nickel	10.5	mg/kg	1.1	1	04/13/18 05:02	04/13/18 15:36	7440-02-0	
Silver	ND	mg/kg	0.56	1	04/13/18 05:02	04/13/18 15:36	7440-22-4	
Tin	ND	mg/kg	4.2	1	04/13/18 05:02	04/13/18 15:36	7440-31-5	
Titanium	185	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:36	7440-32-6	
Zinc	89.9	mg/kg	1.1	1	04/13/18 05:02	04/13/18 15:36	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	14.2	mg/kg	1.1	5	04/18/18 10:36	04/19/18 07:21	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7440-36-0	
Arsenic	5.2	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7440-38-2	
Beryllium	0.51	mg/kg	0.23	20	04/13/18 05:01	04/13/18 09:32	7440-41-7	
Cadmium	0.52	mg/kg	0.092	20	04/13/18 05:01	04/13/18 09:32	7440-43-9	
Cobalt	4.2	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7440-48-4	
Lead	54.2	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:32	7439-92-1	
Lithium	5.0	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7439-93-2	
Selenium	0.59	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7782-49-2	
Strontium	38.6	mg/kg	0.58	20	04/13/18 05:01	04/13/18 09:32	7440-24-6	
Vanadium	29.8	mg/kg	1.2	20	04/13/18 05:01	04/13/18 09:32	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.037	mg/kg	0.022	1	04/13/18 05:02	04/15/18 18:13	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	14.8	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	83-32-9	
Acenaphthylene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) **Lab ID: 10427018004** Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	120-12-7	
Benzo(a)anthracene	708	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	56-55-3	
Benzo(a)pyrene	578	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	50-32-8	
Benzo(b)fluoranthene	772	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	101-55-3	
Butylbenzylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	85-68-7	
Carbazole	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	59-50-7	
4-Chloroaniline	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	108-60-1	
2-Chloronaphthalene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	91-58-7	
2-Chlorophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	7005-72-3	
Chrysene	669	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	53-70-3	
Dibenzofuran	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	120-83-2	
Diethylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	105-67-9	
Dimethylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	131-11-3	
Di-n-butylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1990	1	04/13/18 17:55	04/19/18 20:39	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	606-20-2	
Di-n-octylphthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	117-81-7	
Fluoranthene	1300	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	206-44-0	
Fluorene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	87-68-3	
Hexachlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	118-74-1	
Hexachloroethane	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	193-39-5	
Isophorone	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	78-59-1	
1-Methylnaphthalene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	90-12-0	
2-Methylnaphthalene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	95-48-7	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) **Lab ID: 10427018004** Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	773	1	04/13/18 17:55	04/19/18 20:39		
Naphthalene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	91-20-3	
2-Nitroaniline	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	88-74-4	
3-Nitroaniline	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	99-09-2	
4-Nitroaniline	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	100-01-6	
Nitrobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	98-95-3	
2-Nitrophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	88-75-5	
4-Nitrophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	86-30-6	
Pentachlorophenol	ND	ug/kg	785	1	04/13/18 17:55	04/19/18 20:39	87-86-5	
Phenanthrene	887	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	85-01-8	
Phenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	108-95-2	
Pyrene	1180	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	387	1	04/13/18 17:55	04/19/18 20:39	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	63	%	43-125	1	04/13/18 17:55	04/19/18 20:39	4165-60-0	
2-Fluorobiphenyl (S)	70	%	30-132	1	04/13/18 17:55	04/19/18 20:39	321-60-8	
p-Terphenyl-d14 (S)	88	%	62-125	1	04/13/18 17:55	04/19/18 20:39	1718-51-0	
Phenol-d6 (S)	68	%	48-125	1	04/13/18 17:55	04/19/18 20:39	13127-88-3	
2-Fluorophenol (S)	65	%	40-125	1	04/13/18 17:55	04/19/18 20:39	367-12-4	
2,4,6-Tribromophenol (S)	81	%	60-125	1	04/13/18 17:55	04/19/18 20:39	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	89.1	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	83-32-9	
Acenaphthylene	70.0	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	208-96-8	
Anthracene	348	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	120-12-7	
Benzo(a)anthracene	662	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	56-55-3	
Benzo(a)pyrene	515	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	50-32-8	
Benzo(b)fluoranthene	670	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	205-99-2	
Benzo(g,h,i)perylene	274	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	191-24-2	
Benzo(k)fluoranthene	285	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	207-08-9	
Chrysene	593	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	218-01-9	
Dibenz(a,h)anthracene	110	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	53-70-3	
Fluoranthene	1310	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	206-44-0	
Fluorene	130	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	86-73-7	
Indeno(1,2,3-cd)pyrene	278	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	193-39-5	
Naphthalene	ND	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	91-20-3	
Phenanthrene	1000	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	85-01-8	
Pyrene	1060	ug/kg	58.6	5	04/12/18 11:52	04/17/18 13:57	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	78	%	42-125	5	04/12/18 11:52	04/17/18 13:57	321-60-8	D3
p-Terphenyl-d14 (S)	85	%	57-125	5	04/12/18 11:52	04/17/18 13:57	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) Lab ID: 10427018004 Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1400	1	04/21/18 11:05	04/21/18 21:54	67-64-1	
Allyl chloride	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	107-05-1	
Benzene	ND	ug/kg	28.0	1	04/21/18 11:05	04/21/18 21:54	71-43-2	
Bromobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	108-86-1	
Bromochloromethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	74-97-5	
Bromodichloromethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	75-27-4	
Bromoform	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	75-25-2	
Bromomethane	ND	ug/kg	699	1	04/21/18 11:05	04/21/18 21:54	74-83-9	
2-Butanone (MEK)	ND	ug/kg	350	1	04/21/18 11:05	04/21/18 21:54	78-93-3	
n-Butylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	104-51-8	
sec-Butylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	135-98-8	
tert-Butylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	98-06-6	
Carbon tetrachloride	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	56-23-5	
Chlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	108-90-7	
Chloroethane	ND	ug/kg	699	1	04/21/18 11:05	04/21/18 21:54	75-00-3	
Chloroform	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	67-66-3	
Chloromethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	74-87-3	
2-Chlorotoluene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	95-49-8	
4-Chlorotoluene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	699	1	04/21/18 11:05	04/21/18 21:54	96-12-8	
Dibromochloromethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	106-93-4	
Dibromomethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	75-71-8	
1,1-Dichloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	75-34-3	
1,2-Dichloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	107-06-2	
1,1-Dichloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	156-60-5	
Dichlorofluoromethane	ND	ug/kg	699	1	04/21/18 11:05	04/21/18 21:54	75-43-4	
1,2-Dichloropropane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	78-87-5	
1,3-Dichloropropane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	142-28-9	
2,2-Dichloropropane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	594-20-7	
1,1-Dichloropropene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	60-29-7	
Ethylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	350	1	04/21/18 11:05	04/21/18 21:54	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	98-82-8	
p-Isopropyltoluene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	99-87-6	
Methylene Chloride	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	350	1	04/21/18 11:05	04/21/18 21:54	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-B1 (11-13 WM) **Lab ID: 10427018004** Collected: 04/11/18 13:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	1634-04-4	
Naphthalene	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	91-20-3	
n-Propylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	103-65-1	
Styrene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	79-34-5	
Tetrachloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	127-18-4	
Tetrahydrofuran	ND	ug/kg	2800	1	04/21/18 11:05	04/21/18 21:54	109-99-9	
Toluene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	79-00-5	
Trichloroethene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	79-01-6	
Trichlorofluoromethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	280	1	04/21/18 11:05	04/21/18 21:54	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	69.9	1	04/21/18 11:05	04/21/18 21:54	108-67-8	
Vinyl chloride	ND	ug/kg	28.0	1	04/21/18 11:05	04/21/18 21:54	75-01-4	
Xylene (Total)	ND	ug/kg	210	1	04/21/18 11:05	04/21/18 21:54	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/21/18 11:05	04/21/18 21:54	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1	04/21/18 11:05	04/21/18 21:54	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	04/21/18 11:05	04/21/18 21:54	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	235	100	04/18/18 10:45	04/19/18 14:08	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	14.2	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.30	1	04/20/18 10:25	04/20/18 13:40	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.1	mg/kg	0.99	1	04/18/18 14:45	04/20/18 01:41	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: **FD-SB-C1 (5-8 WM)** Lab ID: **10427018005** Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.3	1	04/25/18 10:56	04/27/18 15:34	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	309-00-2	
alpha-BHC	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	319-84-6	
beta-BHC	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	319-85-7	
delta-BHC	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	58-89-9	
Chlordane (Technical)	ND	ug/kg	425	20	04/16/18 09:32	04/17/18 02:09	57-74-9	
alpha-Chlordane	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	5103-71-9	
gamma-Chlordane	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	5103-74-2	
4,4'-DDD	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	72-54-8	
4,4'-DDE	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	72-55-9	
4,4'-DDT	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	50-29-3	
Dieldrin	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	60-57-1	
Endosulfan I	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	959-98-8	
Endosulfan II	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	33213-65-9	
Endosulfan sulfate	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	1031-07-8	
Endrin	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	72-20-8	
Endrin aldehyde	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	7421-93-4	
Endrin ketone	ND	ug/kg	84.8	20	04/16/18 09:32	04/17/18 02:09	53494-70-5	
Heptachlor	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	76-44-8	
Heptachlor epoxide	ND	ug/kg	42.5	20	04/16/18 09:32	04/17/18 02:09	1024-57-3	
Methoxychlor	ND	ug/kg	425	20	04/16/18 09:32	04/17/18 02:09	72-43-5	
Toxaphene	ND	ug/kg	1270	20	04/16/18 09:32	04/17/18 02:09	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/16/18 09:32	04/17/18 02:09	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/16/18 09:32	04/17/18 02:09	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11141-16-5	
PCB-1242 (Aroclor 1242)	1240	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	12672-29-6	
PCB-1254 (Aroclor 1254)	170	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	11100-14-4	
PCB, Total	1410	ug/kg	42.0	1	04/13/18 19:35	04/16/18 17:36	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/13/18 19:35	04/16/18 17:36	877-09-8	
Decachlorobiphenyl (S)	80	%	30-134	1	04/13/18 19:35	04/16/18 17:36	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) Lab ID: 10427018005 Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	200	mg/kg	106	10	04/12/18 14:19	04/13/18 14:57		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/12/18 14:19	04/13/18 14:57	638-68-6	S4
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	ND	mg/kg	13.1	1	04/23/18 09:23	04/24/18 00:11		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/23/18 09:23	04/24/18 00:11	98-08-8	
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	6440	mg/kg	12.5	1	04/13/18 05:02	04/13/18 15:39	7429-90-5	
Barium	114	mg/kg	0.62	1	04/13/18 05:02	04/13/18 15:39	7440-39-3	
Boron	17.0	mg/kg	9.4	1	04/13/18 05:02	04/13/18 15:39	7440-42-8	
Copper	61.2	mg/kg	0.62	1	04/13/18 05:02	04/13/18 15:39	7440-50-8	
Iron	16800	mg/kg	15.6	5	04/13/18 05:02	04/13/18 16:06	7439-89-6	
Manganese	264	mg/kg	0.31	1	04/13/18 05:02	04/13/18 15:39	7439-96-5	
Nickel	16.8	mg/kg	1.2	1	04/13/18 05:02	04/13/18 15:39	7440-02-0	
Silver	ND	mg/kg	0.62	1	04/13/18 05:02	04/13/18 15:39	7440-22-4	
Tin	7.2	mg/kg	4.7	1	04/13/18 05:02	04/13/18 15:39	7440-31-5	
Titanium	317	mg/kg	1.6	1	04/13/18 05:02	04/13/18 15:39	7440-32-6	
Zinc	223	mg/kg	1.2	1	04/13/18 05:02	04/13/18 15:39	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	20.6	mg/kg	1.2	5	04/18/18 10:36	04/19/18 07:53	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	1.1	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7440-36-0	
Arsenic	6.0	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7440-38-2	
Beryllium	0.48	mg/kg	0.25	20	04/13/18 05:01	04/13/18 09:35	7440-41-7	
Cadmium	1.4	mg/kg	0.10	20	04/13/18 05:01	04/13/18 09:35	7440-43-9	
Cobalt	8.6	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7440-48-4	
Lead	78.9	mg/kg	0.13	20	04/13/18 05:01	04/13/18 09:35	7439-92-1	
Lithium	5.4	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7439-93-2	
Selenium	ND	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7782-49-2	
Strontium	38.1	mg/kg	0.63	20	04/13/18 05:01	04/13/18 09:35	7440-24-6	
Vanadium	28.8	mg/kg	1.3	20	04/13/18 05:01	04/13/18 09:35	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	1.1	mg/kg	0.025	1	04/13/18 05:02	04/15/18 18:20	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	21.5	%	0.10	1		04/18/18 12:41		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) Lab ID: 10427018005 Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	208-96-8	
Anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	120-12-7	
Benzo(a)anthracene	529	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	56-55-3	
Benzo(a)pyrene	463	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	50-32-8	
Benzo(b)fluoranthene	617	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	101-55-3	
Butylbenzylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	85-68-7	
Carbazole	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	59-50-7	
4-Chloroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	108-60-1	
2-Chloronaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	91-58-7	
2-Chlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	7005-72-3	
Chrysene	535	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	53-70-3	
Dibenzofuran	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	120-83-2	
Diethylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	105-67-9	
Dimethylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	131-11-3	
Di-n-butylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2160	1	04/13/18 17:55	04/19/18 21:07	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	606-20-2	
Di-n-octylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	117-81-7	
Fluoranthene	1050	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	206-44-0	
Fluorene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	87-68-3	
Hexachlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	118-74-1	
Hexachloroethane	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	193-39-5	
Isophorone	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	78-59-1	
1-Methylnaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	90-12-0	
2-Methylnaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) **Lab ID: 10427018005** Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	840	1	04/13/18 17:55	04/19/18 21:07		
Naphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	91-20-3	
2-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	88-74-4	
3-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	99-09-2	
4-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	100-01-6	
Nitrobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	98-95-3	
2-Nitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	88-75-5	
4-Nitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	86-30-6	
Pentachlorophenol	ND	ug/kg	853	1	04/13/18 17:55	04/19/18 21:07	87-86-5	
Phenanthrene	777	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	85-01-8	
Phenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	108-95-2	
Pyrene	1120	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 21:07	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	61	%	43-125	1	04/13/18 17:55	04/19/18 21:07	4165-60-0	
2-Fluorobiphenyl (S)	61	%	30-132	1	04/13/18 17:55	04/19/18 21:07	321-60-8	
p-Terphenyl-d14 (S)	78	%	62-125	1	04/13/18 17:55	04/19/18 21:07	1718-51-0	
Phenol-d6 (S)	62	%	48-125	1	04/13/18 17:55	04/19/18 21:07	13127-88-3	
2-Fluorophenol (S)	62	%	40-125	1	04/13/18 17:55	04/19/18 21:07	367-12-4	
2,4,6-Tribromophenol (S)	74	%	60-125	1	04/13/18 17:55	04/19/18 21:07	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	128	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	83-32-9	
Acenaphthylene	ND	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	208-96-8	
Anthracene	267	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	120-12-7	
Benzo(a)anthracene	601	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	56-55-3	
Benzo(a)pyrene	535	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	50-32-8	
Benzo(b)fluoranthene	699	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	205-99-2	
Benzo(g,h,i)perylene	287	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	191-24-2	
Benzo(k)fluoranthene	244	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	207-08-9	
Chrysene	540	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	218-01-9	
Dibenz(a,h)anthracene	105	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	53-70-3	
Fluoranthene	1150	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	206-44-0	
Fluorene	122	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	86-73-7	
Indeno(1,2,3-cd)pyrene	296	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	193-39-5	
Naphthalene	ND	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	91-20-3	
Phenanthrene	805	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	85-01-8	
Pyrene	994	ug/kg	63.7	5	04/12/18 11:52	04/17/18 14:18	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	79	%	42-125	5	04/12/18 11:52	04/17/18 14:18	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) Lab ID: 10427018005 Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	87	%	57-125	5	04/12/18 11:52	04/17/18 14:18	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1300	1	04/21/18 11:05	04/22/18 00:25	67-64-1	
Allyl chloride	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	107-05-1	
Benzene	ND	ug/kg	26.1	1	04/21/18 11:05	04/22/18 00:25	71-43-2	
Bromobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	108-86-1	
Bromochloromethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	74-97-5	
Bromodichloromethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	75-27-4	
Bromoform	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	75-25-2	
Bromomethane	ND	ug/kg	652	1	04/21/18 11:05	04/22/18 00:25	74-83-9	
2-Butanone (MEK)	ND	ug/kg	326	1	04/21/18 11:05	04/22/18 00:25	78-93-3	
n-Butylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	104-51-8	
sec-Butylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	135-98-8	
tert-Butylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	98-06-6	
Carbon tetrachloride	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	56-23-5	
Chlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	108-90-7	
Chloroethane	ND	ug/kg	652	1	04/21/18 11:05	04/22/18 00:25	75-00-3	
Chloroform	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	67-66-3	
Chloromethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	74-87-3	
2-Chlorotoluene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	95-49-8	
4-Chlorotoluene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	652	1	04/21/18 11:05	04/22/18 00:25	96-12-8	
Dibromochloromethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	106-93-4	
Dibromomethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	75-71-8	
1,1-Dichloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	75-34-3	
1,2-Dichloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	107-06-2	
1,1-Dichloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	156-60-5	
Dichlorofluoromethane	ND	ug/kg	652	1	04/21/18 11:05	04/22/18 00:25	75-43-4	
1,2-Dichloropropane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	78-87-5	
1,3-Dichloropropane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	142-28-9	
2,2-Dichloropropane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	594-20-7	
1,1-Dichloropropene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	60-29-7	
Ethylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	326	1	04/21/18 11:05	04/22/18 00:25	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-C1 (5-8 WM) **Lab ID:** 10427018005 Collected: 04/11/18 14:30 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	98-82-8	
p-Isopropyltoluene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	99-87-6	
Methylene Chloride	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	326	1	04/21/18 11:05	04/22/18 00:25	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	1634-04-4	
Naphthalene	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	91-20-3	
n-Propylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	103-65-1	
Styrene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	79-34-5	
Tetrachloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	127-18-4	
Tetrahydrofuran	ND	ug/kg	2610	1	04/21/18 11:05	04/22/18 00:25	109-99-9	
Toluene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	79-00-5	
Trichloroethene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	79-01-6	
Trichlorofluoromethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	261	1	04/21/18 11:05	04/22/18 00:25	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	65.2	1	04/21/18 11:05	04/22/18 00:25	108-67-8	
Vinyl chloride	ND	ug/kg	26.1	1	04/21/18 11:05	04/22/18 00:25	75-01-4	
Xylene (Total)	ND	ug/kg	196	1	04/21/18 11:05	04/22/18 00:25	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/21/18 11:05	04/22/18 00:25	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/21/18 11:05	04/22/18 00:25	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/21/18 11:05	04/22/18 00:25	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	50.6	20	04/18/18 10:45	04/19/18 14:09	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	20.6	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.32	1	04/20/18 10:25	04/20/18 13:40	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.2	mg/kg	0.97	1	04/18/18 14:45	04/20/18 03:19	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID: 10427018006** Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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1630 Methyl Mercury

Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)

Methyl Mercury	ND	ng/g	14.4	1	04/25/18 10:56	04/27/18 15:40	7439-97-6	N3
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8081B GCS Pesticides

Analytical Method: EPA 8081B Preparation Method: EPA 3550

Aldrin	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	309-00-2	
alpha-BHC	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	319-84-6	
beta-BHC	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	319-85-7	
delta-BHC	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	58-89-9	
Chlordane (Technical)	ND	ug/kg	25.2	1	04/16/18 09:32	04/17/18 00:37	57-74-9	
alpha-Chlordane	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	5103-74-2	
4,4'-DDD	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	72-54-8	
4,4'-DDE	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	72-55-9	
4,4'-DDT	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	50-29-3	
Dieldrin	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	60-57-1	
Endosulfan I	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	959-98-8	
Endosulfan II	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	33213-65-9	
Endosulfan sulfate	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	1031-07-8	
Endrin	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	72-20-8	
Endrin aldehyde	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	7421-93-4	
Endrin ketone	ND	ug/kg	5.0	1	04/16/18 09:32	04/17/18 00:37	53494-70-5	
Heptachlor	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.5	1	04/16/18 09:32	04/17/18 00:37	1024-57-3	
Methoxychlor	ND	ug/kg	25.2	1	04/16/18 09:32	04/17/18 00:37	72-43-5	
Toxaphene	ND	ug/kg	75.4	1	04/16/18 09:32	04/17/18 00:37	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	93	%	30-150	1	04/16/18 09:32	04/17/18 00:37	877-09-8	
Decachlorobiphenyl (S)	87	%	30-150	1	04/16/18 09:32	04/17/18 00:37	2051-24-3	

8082A GCS PCB

Analytical Method: EPA 8082A Preparation Method: EPA 3550

PCB-1016 (Aroclor 1016)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	11100-14-4	
PCB, Total	ND	ug/kg	49.8	1	04/13/18 19:35	04/16/18 17:52	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	48-125	1	04/13/18 19:35	04/16/18 17:52	877-09-8	
Decachlorobiphenyl (S)	83	%	30-134	1	04/13/18 19:35	04/16/18 17:52	2051-24-3	

WIDRO GCS

Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO

WDRO C10-C28	ND	mg/kg	14.4	1	04/12/18 14:19	04/13/18 13:11		
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID:** 10427018006 Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	78	%	50-150	1	04/12/18 14:19	04/13/18 13:11	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	16.9	1	04/23/18 09:23	04/24/18 00:36		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/23/18 09:23	04/24/18 00:36	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	13000	mg/kg	15.1	1	04/13/18 05:02	04/13/18 15:42	7429-90-5	
Barium	171	mg/kg	0.76	1	04/13/18 05:02	04/13/18 15:42	7440-39-3	
Boron	145	mg/kg	11.3	1	04/13/18 05:02	04/13/18 15:42	7440-42-8	
Copper	25.1	mg/kg	0.76	1	04/13/18 05:02	04/13/18 15:42	7440-50-8	
Iron	35900	mg/kg	18.9	5	04/13/18 05:02	04/13/18 16:08	7439-89-6	
Manganese	194	mg/kg	0.38	1	04/13/18 05:02	04/13/18 15:42	7439-96-5	
Nickel	25.5	mg/kg	1.5	1	04/13/18 05:02	04/13/18 15:42	7440-02-0	
Silver	ND	mg/kg	0.76	1	04/13/18 05:02	04/13/18 15:42	7440-22-4	
Tin	ND	mg/kg	5.7	1	04/13/18 05:02	04/13/18 15:42	7440-31-5	
Titanium	653	mg/kg	1.9	1	04/13/18 05:02	04/13/18 15:42	7440-32-6	
Zinc	171	mg/kg	1.5	1	04/13/18 05:02	04/13/18 15:42	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	44.0	mg/kg	1.4	5	04/18/18 10:36	04/19/18 07:57	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.7	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7440-36-0	
Arsenic	24.9	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7440-38-2	
Beryllium	3.6	mg/kg	0.29	20	04/13/18 05:01	04/13/18 09:38	7440-41-7	
Cadmium	2.2	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:38	7440-43-9	
Cobalt	8.2	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7440-48-4	
Lead	30.9	mg/kg	0.15	20	04/13/18 05:01	04/13/18 09:38	7439-92-1	
Lithium	12.0	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7439-93-2	
Selenium	1.6	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7782-49-2	
Strontium	66.7	mg/kg	0.73	20	04/13/18 05:01	04/13/18 09:38	7440-24-6	
Vanadium	121	mg/kg	1.5	20	04/13/18 05:01	04/13/18 09:38	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.060	mg/kg	0.030	1	04/13/18 05:02	04/15/18 18:22	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	33.8	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	83-32-9	
Acenaphthylene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID: 10427018006** Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	120-12-7	
Benzo(a)anthracene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	56-55-3	
Benzo(a)pyrene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	101-55-3	
Butylbenzylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	85-68-7	
Carbazole	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	59-50-7	
4-Chloroaniline	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	108-60-1	
2-Chloronaphthalene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	91-58-7	
2-Chlorophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	7005-72-3	
Chrysene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	53-70-3	
Dibenzofuran	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	120-83-2	
Diethylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	105-67-9	
Dimethylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	131-11-3	
Di-n-butylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2560	1	04/13/18 17:55	04/19/18 16:52	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	606-20-2	
Di-n-octylphthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	117-81-7	
Fluoranthene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	206-44-0	
Fluorene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	87-68-3	
Hexachlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	118-74-1	
Hexachloroethane	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	193-39-5	
Isophorone	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	78-59-1	
1-Methylnaphthalene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	90-12-0	
2-Methylnaphthalene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	95-48-7	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID: 10427018006** Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	993	1	04/13/18 17:55	04/19/18 16:52		
Naphthalene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	91-20-3	
2-Nitroaniline	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	88-74-4	
3-Nitroaniline	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	99-09-2	
4-Nitroaniline	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	100-01-6	
Nitrobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	98-95-3	
2-Nitrophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	88-75-5	
4-Nitrophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	86-30-6	
Pentachlorophenol	ND	ug/kg	1010	1	04/13/18 17:55	04/19/18 16:52	87-86-5	
Phenanthrene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	85-01-8	
Phenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	108-95-2	
Pyrene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	497	1	04/13/18 17:55	04/19/18 16:52	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/13/18 17:55	04/19/18 16:52	4165-60-0	
2-Fluorobiphenyl (S)	53	%.	30-132	1	04/13/18 17:55	04/19/18 16:52	321-60-8	
p-Terphenyl-d14 (S)	78	%.	62-125	1	04/13/18 17:55	04/19/18 16:52	1718-51-0	
Phenol-d6 (S)	56	%.	48-125	1	04/13/18 17:55	04/19/18 16:52	13127-88-3	
2-Fluorophenol (S)	51	%.	40-125	1	04/13/18 17:55	04/19/18 16:52	367-12-4	
2,4,6-Tribromophenol (S)	54	%.	60-125	1	04/13/18 17:55	04/19/18 16:52	118-79-6	SO

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	83-32-9	
Acenaphthylene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	208-96-8	
Anthracene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	120-12-7	
Benzo(a)anthracene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	56-55-3	
Benzo(a)pyrene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	207-08-9	
Chrysene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	53-70-3	
Fluoranthene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	206-44-0	
Fluorene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	193-39-5	
Naphthalene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	91-20-3	
Phenanthrene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	85-01-8	
Pyrene	ND	ug/kg	15.1	1	04/12/18 11:52	04/16/18 19:27	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	63	%.	42-125	1	04/12/18 11:52	04/16/18 19:27	321-60-8	
p-Terphenyl-d14 (S)	97	%.	57-125	1	04/12/18 11:52	04/16/18 19:27	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID: 10427018006** Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1570	1	04/21/18 11:05	04/22/18 00:42	67-64-1	
Allyl chloride	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	107-05-1	
Benzene	ND	ug/kg	31.5	1	04/21/18 11:05	04/22/18 00:42	71-43-2	
Bromobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	108-86-1	
Bromochloromethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	74-97-5	
Bromodichloromethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	75-27-4	
Bromoform	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	75-25-2	
Bromomethane	ND	ug/kg	787	1	04/21/18 11:05	04/22/18 00:42	74-83-9	
2-Butanone (MEK)	ND	ug/kg	394	1	04/21/18 11:05	04/22/18 00:42	78-93-3	
n-Butylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	104-51-8	
sec-Butylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	135-98-8	
tert-Butylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	98-06-6	
Carbon tetrachloride	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	56-23-5	
Chlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	108-90-7	
Chloroethane	ND	ug/kg	787	1	04/21/18 11:05	04/22/18 00:42	75-00-3	
Chloroform	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	67-66-3	
Chloromethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	74-87-3	
2-Chlorotoluene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	95-49-8	
4-Chlorotoluene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	787	1	04/21/18 11:05	04/22/18 00:42	96-12-8	
Dibromochloromethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	106-93-4	
Dibromomethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	75-71-8	
1,1-Dichloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	75-34-3	
1,2-Dichloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	107-06-2	
1,1-Dichloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	156-60-5	
Dichlorofluoromethane	ND	ug/kg	787	1	04/21/18 11:05	04/22/18 00:42	75-43-4	
1,2-Dichloropropane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	78-87-5	
1,3-Dichloropropane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	142-28-9	
2,2-Dichloropropane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	594-20-7	
1,1-Dichloropropene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	60-29-7	
Ethylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	394	1	04/21/18 11:05	04/22/18 00:42	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	98-82-8	
p-Isopropyltoluene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	99-87-6	
Methylene Chloride	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	394	1	04/21/18 11:05	04/22/18 00:42	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-TT-03 (2-5 WM) **Lab ID:** 10427018006 Collected: 04/11/18 14:50 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	1634-04-4	
Naphthalene	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	91-20-3	
n-Propylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	103-65-1	
Styrene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	79-34-5	
Tetrachloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	127-18-4	
Tetrahydrofuran	ND	ug/kg	3150	1	04/21/18 11:05	04/22/18 00:42	109-99-9	
Toluene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	79-00-5	
Trichloroethene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	79-01-6	
Trichlorofluoromethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	315	1	04/21/18 11:05	04/22/18 00:42	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	78.7	1	04/21/18 11:05	04/22/18 00:42	108-67-8	
Vinyl chloride	ND	ug/kg	31.5	1	04/21/18 11:05	04/22/18 00:42	75-01-4	
Xylene (Total)	ND	ug/kg	236	1	04/21/18 11:05	04/22/18 00:42	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/21/18 11:05	04/22/18 00:42	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	04/21/18 11:05	04/22/18 00:42	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125	1	04/21/18 11:05	04/22/18 00:42	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.6	5	04/18/18 10:45	04/19/18 14:23	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	44.0	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.53	1	04/20/18 10:25	04/20/18 13:41	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	5.1	mg/kg	0.99	1	04/18/18 14:45	04/20/18 00:03	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) Lab ID: 10427018007 Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.1	1	04/25/18 10:56	04/27/18 15:47	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	309-00-2	
alpha-BHC	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	319-84-6	
beta-BHC	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	319-85-7	
delta-BHC	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	58-89-9	
Chlordane (Technical)	ND	ug/kg	403	20	04/16/18 09:32	04/17/18 02:27	57-74-9	
alpha-Chlordane	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	5103-71-9	
gamma-Chlordane	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	5103-74-2	
4,4'-DDD	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	72-54-8	
4,4'-DDE	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	72-55-9	
4,4'-DDT	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	50-29-3	
Dieldrin	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	60-57-1	
Endosulfan I	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	959-98-8	
Endosulfan II	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	33213-65-9	
Endosulfan sulfate	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	1031-07-8	
Endrin	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	72-20-8	
Endrin aldehyde	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	7421-93-4	
Endrin ketone	ND	ug/kg	80.4	20	04/16/18 09:32	04/17/18 02:27	53494-70-5	
Heptachlor	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	76-44-8	
Heptachlor epoxide	ND	ug/kg	40.3	20	04/16/18 09:32	04/17/18 02:27	1024-57-3	
Methoxychlor	ND	ug/kg	403	20	04/16/18 09:32	04/17/18 02:27	72-43-5	
Toxaphene	ND	ug/kg	1210	20	04/16/18 09:32	04/17/18 02:27	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	20	04/16/18 09:32	04/17/18 02:27	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	20	04/16/18 09:32	04/17/18 02:27	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	11100-14-4	
PCB, Total	ND	ug/kg	39.8	1	04/13/18 19:35	04/16/18 18:08	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	85	%.	48-125	1	04/13/18 19:35	04/16/18 18:08	877-09-8	
Decachlorobiphenyl (S)	105	%.	30-134	1	04/13/18 19:35	04/16/18 18:08	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) Lab ID: 10427018007 Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	57.5	mg/kg	9.6	1	04/12/18 19:34	04/16/18 12:08		T6
Surrogates								
n-Triacontane (S)	90	%	50-150	1	04/12/18 19:34	04/16/18 12:08	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.6	1	04/23/18 09:23	04/24/18 01:24		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/23/18 09:23	04/24/18 01:24	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	6480	mg/kg	12.0	1	04/13/18 05:02	04/13/18 15:45	7429-90-5	
Barium	132	mg/kg	0.60	1	04/13/18 05:02	04/13/18 15:45	7440-39-3	
Boron	34.0	mg/kg	9.0	1	04/13/18 05:02	04/13/18 15:45	7440-42-8	
Copper	25.3	mg/kg	0.60	1	04/13/18 05:02	04/13/18 15:45	7440-50-8	
Iron	19200	mg/kg	15.0	5	04/13/18 05:02	04/13/18 16:11	7439-89-6	
Manganese	594	mg/kg	0.30	1	04/13/18 05:02	04/13/18 15:45	7439-96-5	
Nickel	18.2	mg/kg	1.2	1	04/13/18 05:02	04/13/18 15:45	7440-02-0	
Silver	ND	mg/kg	0.60	1	04/13/18 05:02	04/13/18 15:45	7440-22-4	
Tin	ND	mg/kg	4.5	1	04/13/18 05:02	04/13/18 15:45	7440-31-5	
Titanium	247	mg/kg	1.5	1	04/13/18 05:02	04/13/18 15:45	7440-32-6	
Zinc	187	mg/kg	1.2	1	04/13/18 05:02	04/13/18 15:45	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	27.8	mg/kg	1.2	5	04/18/18 10:36	04/19/18 08:02	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.6	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7440-36-0	
Arsenic	10.1	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7440-38-2	
Beryllium	0.56	mg/kg	0.24	20	04/13/18 05:01	04/13/18 09:41	7440-41-7	
Cadmium	0.95	mg/kg	0.095	20	04/13/18 05:01	04/13/18 09:41	7440-43-9	
Cobalt	6.2	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7440-48-4	
Lead	132	mg/kg	0.12	20	04/13/18 05:01	04/13/18 09:41	7439-92-1	
Lithium	5.1	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7439-93-2	
Selenium	0.92	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7782-49-2	
Strontium	40.4	mg/kg	0.59	20	04/13/18 05:01	04/13/18 09:41	7440-24-6	
Vanadium	37.5	mg/kg	1.2	20	04/13/18 05:01	04/13/18 09:41	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.060	mg/kg	0.020	1	04/13/18 05:02	04/15/18 18:24	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	17.3	%	0.10	1		04/18/18 12:41		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) **Lab ID: 10427018007** Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	745	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	208-96-8	
Anthracene	1480	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	120-12-7	
Benzo(a)anthracene	3460	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	56-55-3	
Benzo(a)pyrene	2620	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	50-32-8	
Benzo(b)fluoranthene	3260	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	205-99-2	
Benzo(g,h,i)perylene	1390	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	191-24-2	
Benzo(k)fluoranthene	1550	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	101-55-3	
Butylbenzylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	85-68-7	
Carbazole	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	59-50-7	
4-Chloroaniline	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	108-60-1	
2-Chloronaphthalene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	91-58-7	
2-Chlorophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	7005-72-3	
Chrysene	3400	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	53-70-3	
Dibenzofuran	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	120-83-2	
Diethylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	105-67-9	
Dimethylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	131-11-3	
Di-n-butylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2050	1	04/13/18 17:55	04/20/18 16:30	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	606-20-2	
Di-n-octylphthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	117-81-7	
Fluoranthene	8050	ug/kg	1990	5	04/13/18 17:55	04/19/18 20:45	206-44-0	
Fluorene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	87-68-3	
Hexachlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	118-74-1	
Hexachloroethane	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	67-72-1	
Indeno(1,2,3-cd)pyrene	1230	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	193-39-5	
Isophorone	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	78-59-1	
1-Methylnaphthalene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	90-12-0	
2-Methylnaphthalene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) **Lab ID: 10427018007** Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	796	1	04/13/18 17:55	04/20/18 16:30		
Naphthalene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	91-20-3	
2-Nitroaniline	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	88-74-4	
3-Nitroaniline	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	99-09-2	
4-Nitroaniline	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	100-01-6	
Nitrobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	98-95-3	
2-Nitrophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	88-75-5	
4-Nitrophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	86-30-6	
Pentachlorophenol	ND	ug/kg	808	1	04/13/18 17:55	04/20/18 16:30	87-86-5	
Phenanthrene	4600	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	85-01-8	
Phenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	108-95-2	
Pyrene	6860	ug/kg	1990	5	04/13/18 17:55	04/19/18 20:45	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	398	1	04/13/18 17:55	04/20/18 16:30	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	55	%	43-125	1	04/13/18 17:55	04/20/18 16:30	4165-60-0	
2-Fluorobiphenyl (S)	54	%	30-132	1	04/13/18 17:55	04/20/18 16:30	321-60-8	
p-Terphenyl-d14 (S)	67	%	62-125	1	04/13/18 17:55	04/20/18 16:30	1718-51-0	
Phenol-d6 (S)	60	%	48-125	1	04/13/18 17:55	04/20/18 16:30	13127-88-3	
2-Fluorophenol (S)	58	%	40-125	1	04/13/18 17:55	04/20/18 16:30	367-12-4	
2,4,6-Tribromophenol (S)	60	%	60-125	1	04/13/18 17:55	04/20/18 16:30	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	83-32-9	
Acenaphthylene	1190	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	208-96-8	
Anthracene	2070	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	120-12-7	
Benzo(a)anthracene	4880	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	56-55-3	
Benzo(a)pyrene	3730	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	50-32-8	
Benzo(b)fluoranthene	4990	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	205-99-2	
Benzo(g,h,i)perylene	1870	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	191-24-2	
Benzo(k)fluoranthene	1660	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	207-08-9	
Chrysene	4150	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	218-01-9	
Dibenz(a,h)anthracene	697	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	53-70-3	
Fluoranthene	9760	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	206-44-0	
Fluorene	337	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	86-73-7	
Indeno(1,2,3-cd)pyrene	1950	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	193-39-5	
Naphthalene	ND	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	91-20-3	
Phenanthrene	5500	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	85-01-8	
Pyrene	7640	ug/kg	301	25	04/12/18 11:52	04/17/18 13:37	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	25	04/12/18 11:52	04/17/18 13:37	321-60-8	D4,S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427018

Sample: **FD-SB-D1 (11-16 WM)** Lab ID: **10427018007** Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	0	%	57-125	25	04/12/18 11:52	04/17/18 13:37	1718-51-0	S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1290	1	04/21/18 11:05	04/22/18 00:59	67-64-1	
Allyl chloride	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	107-05-1	
Benzene	ND	ug/kg	25.8	1	04/21/18 11:05	04/22/18 00:59	71-43-2	
Bromobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	108-86-1	
Bromochloromethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	74-97-5	
Bromodichloromethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	75-27-4	
Bromoform	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	75-25-2	
Bromomethane	ND	ug/kg	644	1	04/21/18 11:05	04/22/18 00:59	74-83-9	
2-Butanone (MEK)	ND	ug/kg	322	1	04/21/18 11:05	04/22/18 00:59	78-93-3	
n-Butylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	104-51-8	
sec-Butylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	135-98-8	
tert-Butylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	98-06-6	
Carbon tetrachloride	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	56-23-5	
Chlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	108-90-7	
Chloroethane	ND	ug/kg	644	1	04/21/18 11:05	04/22/18 00:59	75-00-3	
Chloroform	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	67-66-3	
Chloromethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	74-87-3	
2-Chlorotoluene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	95-49-8	
4-Chlorotoluene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	644	1	04/21/18 11:05	04/22/18 00:59	96-12-8	
Dibromochloromethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	106-93-4	
Dibromomethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	75-71-8	
1,1-Dichloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	75-34-3	
1,2-Dichloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	107-06-2	
1,1-Dichloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	156-60-5	
Dichlorofluoromethane	ND	ug/kg	644	1	04/21/18 11:05	04/22/18 00:59	75-43-4	
1,2-Dichloropropane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	78-87-5	
1,3-Dichloropropane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	142-28-9	
2,2-Dichloropropane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	594-20-7	
1,1-Dichloropropene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	60-29-7	
Ethylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	322	1	04/21/18 11:05	04/22/18 00:59	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-D1 (11-16 WM) Lab ID: 10427018007 Collected: 04/11/18 15:35 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	98-82-8	
p-Isopropyltoluene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	99-87-6	
Methylene Chloride	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	322	1	04/21/18 11:05	04/22/18 00:59	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	1634-04-4	
Naphthalene	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	91-20-3	
n-Propylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	103-65-1	
Styrene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	79-34-5	
Tetrachloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	127-18-4	
Tetrahydrofuran	ND	ug/kg	2580	1	04/21/18 11:05	04/22/18 00:59	109-99-9	
Toluene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	79-00-5	
Trichloroethene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	79-01-6	
Trichlorofluoromethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	258	1	04/21/18 11:05	04/22/18 00:59	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	64.4	1	04/21/18 11:05	04/22/18 00:59	108-67-8	
Vinyl chloride	ND	ug/kg	25.8	1	04/21/18 11:05	04/22/18 00:59	75-01-4	
Xylene (Total)	ND	ug/kg	193	1	04/21/18 11:05	04/22/18 00:59	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/21/18 11:05	04/22/18 00:59	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/21/18 11:05	04/22/18 00:59	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125	1	04/21/18 11:05	04/22/18 00:59	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	119	50	04/18/18 10:45	04/19/18 14:09	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	27.8	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.45	1	04/20/18 10:25	04/20/18 13:41	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.1	mg/kg	1.0	1	04/18/18 14:45	04/20/18 02:40	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.2	1	04/25/18 10:56	04/27/18 15:54	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	309-00-2	
alpha-BHC	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	319-84-6	
beta-BHC	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	319-85-7	
delta-BHC	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	58-89-9	
Chlordane (Technical)	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	57-74-9	
alpha-Chlordane	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	5103-71-9	
gamma-Chlordane	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	5103-74-2	
4,4'-DDD	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	72-54-8	
4,4'-DDE	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	72-55-9	
4,4'-DDT	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	50-29-3	
Dieldrin	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	60-57-1	
Endosulfan I	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	959-98-8	
Endosulfan II	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	33213-65-9	
Endosulfan sulfate	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	1031-07-8	
Endrin	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	72-20-8	
Endrin aldehyde	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	7421-93-4	
Endrin ketone	ND	ug/kg	194	50	04/16/18 09:32	04/17/18 01:32	53494-70-5	
Heptachlor	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	76-44-8	
Heptachlor epoxide	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	1024-57-3	
Methoxychlor	ND	ug/kg	97.4	50	04/16/18 09:32	04/17/18 01:32	72-43-5	
Toxaphene	ND	ug/kg	2910	50	04/16/18 09:32	04/17/18 01:32	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	04/16/18 09:32	04/17/18 01:32	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	50	04/16/18 09:32	04/17/18 01:32	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	53469-21-9	
PCB-1248 (Aroclor 1248)	104	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	12672-29-6	
PCB-1254 (Aroclor 1254)	127	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	11100-14-4	
PCB, Total	231	ug/kg	38.5	1	04/13/18 19:35	04/16/18 18:24	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	77	%	48-125	1	04/13/18 19:35	04/16/18 18:24	877-09-8	
Decachlorobiphenyl (S)	69	%	30-134	1	04/13/18 19:35	04/16/18 18:24	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1520	mg/kg	873	20	04/12/18 19:34	04/16/18 11:19		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/12/18 19:34	04/16/18 11:19	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	16.0	1	04/23/18 09:23	04/24/18 01:00		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/23/18 09:23	04/24/18 01:00	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	6100	mg/kg	11.4	1	04/13/18 05:02	04/13/18 15:47	7429-90-5	
Barium	60.1	mg/kg	0.57	1	04/13/18 05:02	04/13/18 15:47	7440-39-3	
Boron	31.3	mg/kg	8.6	1	04/13/18 05:02	04/13/18 15:47	7440-42-8	
Copper	74.7	mg/kg	0.57	1	04/13/18 05:02	04/13/18 15:47	7440-50-8	
Iron	24800	mg/kg	14.3	5	04/13/18 05:02	04/13/18 16:14	7439-89-6	
Manganese	360	mg/kg	0.29	1	04/13/18 05:02	04/13/18 15:47	7439-96-5	
Nickel	20.6	mg/kg	1.1	1	04/13/18 05:02	04/13/18 15:47	7440-02-0	
Silver	ND	mg/kg	0.57	1	04/13/18 05:02	04/13/18 15:47	7440-22-4	
Tin	11.2	mg/kg	4.3	1	04/13/18 05:02	04/13/18 15:47	7440-31-5	
Titanium	184	mg/kg	1.4	1	04/13/18 05:02	04/13/18 15:47	7440-32-6	
Zinc	227	mg/kg	1.1	1	04/13/18 05:02	04/13/18 15:47	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	21.2	mg/kg	1.1	5	04/18/18 10:36	04/19/18 08:06	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7440-36-0	
Arsenic	5.6	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7440-38-2	
Beryllium	0.42	mg/kg	0.22	20	04/13/18 05:01	04/13/18 09:44	7440-41-7	
Cadmium	2.2	mg/kg	0.087	20	04/13/18 05:01	04/13/18 09:44	7440-43-9	
Cobalt	7.1	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7440-48-4	
Lead	149	mg/kg	0.11	20	04/13/18 05:01	04/13/18 09:44	7439-92-1	
Lithium	3.8	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7439-93-2	
Selenium	ND	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7782-49-2	
Strontium	42.3	mg/kg	0.55	20	04/13/18 05:01	04/13/18 09:44	7440-24-6	
Vanadium	24.4	mg/kg	1.1	20	04/13/18 05:01	04/13/18 09:44	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.13	mg/kg	0.020	1	04/13/18 05:02	04/15/18 18:26	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	14.3	%	0.10	1		04/18/18 12:42		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	208-96-8	
Anthracene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	120-12-7	
Benzo(a)anthracene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	56-55-3	
Benzo(a)pyrene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	205-99-2	M1
Benzo(g,h,i)perylene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	101-55-3	
Butylbenzylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	85-68-7	
Carbazole	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	59-50-7	
4-Chloroaniline	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	108-60-1	
2-Chloronaphthalene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	91-58-7	
2-Chlorophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	7005-72-3	
Chrysene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	53-70-3	
Dibenzofuran	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	120-83-2	
Diethylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	105-67-9	
Dimethylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	131-11-3	
Di-n-butylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	19800	1	04/13/18 17:55	04/18/18 18:49	534-52-1	M1
2,4-Dinitrophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	51-28-5	M1
2,4-Dinitrotoluene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	606-20-2	
Di-n-octylphthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	117-81-7	
Fluoranthene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	206-44-0	M1
Fluorene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	87-68-3	
Hexachlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	118-74-1	
Hexachloroethane	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	67-72-1	M1
Indeno(1,2,3-cd)pyrene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	193-39-5	
Isophorone	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	78-59-1	
1-Methylnaphthalene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	90-12-0	
2-Methylnaphthalene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	7690	1	04/13/18 17:55	04/18/18 18:49		
Naphthalene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	91-20-3	
2-Nitroaniline	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	88-74-4	
3-Nitroaniline	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	99-09-2	
4-Nitroaniline	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	100-01-6	
Nitrobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	98-95-3	
2-Nitrophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	88-75-5	
4-Nitrophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	86-30-6	
Pentachlorophenol	ND	ug/kg	7800	1	04/13/18 17:55	04/18/18 18:49	87-86-5	
Phenanthrene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	85-01-8	
Phenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	108-95-2	
Pyrene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	129-00-0	M1
1,2,4-Trichlorobenzene	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	3840	1	04/13/18 17:55	04/18/18 18:49	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	1	04/13/18 17:55	04/18/18 18:49	4165-60-0	P3,S0
2-Fluorobiphenyl (S)	0	%	30-132	1	04/13/18 17:55	04/18/18 18:49	321-60-8	S0
p-Terphenyl-d14 (S)	0	%	62-125	1	04/13/18 17:55	04/18/18 18:49	1718-51-0	S0
Phenol-d6 (S)	0	%	48-125	1	04/13/18 17:55	04/18/18 18:49	13127-88-3	S0
2-Fluorophenol (S)	0	%	40-125	1	04/13/18 17:55	04/18/18 18:49	367-12-4	S0
2,4,6-Tribromophenol (S)	0	%	60-125	1	04/13/18 17:55	04/18/18 18:49	118-79-6	S0
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	83-32-9	
Acenaphthylene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	208-96-8	
Anthracene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	120-12-7	
Benzo(a)anthracene	132	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	56-55-3	
Benzo(a)pyrene	143	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	50-32-8	
Benzo(b)fluoranthene	165	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	205-99-2	
Benzo(g,h,i)perylene	219	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	207-08-9	
Chrysene	231	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	53-70-3	
Fluoranthene	229	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	206-44-0	
Fluorene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	193-39-5	
Naphthalene	ND	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	91-20-3	
Phenanthrene	415	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	85-01-8	
Pyrene	421	ug/kg	116	2	04/12/18 11:52	04/17/18 12:36	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) **Lab ID: 10427018008** Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	2	04/12/18 11:52	04/17/18 12:36	321-60-8	D3,P3, S0
p-Terphenyl-d14 (S)	0	%.	57-125	2	04/12/18 11:52	04/17/18 12:36	1718-51-0	S0
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1460	1	04/21/18 11:05	04/22/18 01:16	67-64-1	
Allyl chloride	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	107-05-1	
Benzene	ND	ug/kg	29.3	1	04/21/18 11:05	04/22/18 01:16	71-43-2	
Bromobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	108-86-1	
Bromochloromethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	74-97-5	
Bromodichloromethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	75-27-4	
Bromoform	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	75-25-2	
Bromomethane	ND	ug/kg	732	1	04/21/18 11:05	04/22/18 01:16	74-83-9	
2-Butanone (MEK)	ND	ug/kg	366	1	04/21/18 11:05	04/22/18 01:16	78-93-3	
n-Butylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	104-51-8	
sec-Butylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	135-98-8	
tert-Butylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	98-06-6	
Carbon tetrachloride	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	56-23-5	
Chlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	108-90-7	
Chloroethane	ND	ug/kg	732	1	04/21/18 11:05	04/22/18 01:16	75-00-3	
Chloroform	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	67-66-3	
Chloromethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	74-87-3	
2-Chlorotoluene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	95-49-8	
4-Chlorotoluene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	732	1	04/21/18 11:05	04/22/18 01:16	96-12-8	
Dibromochloromethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	106-93-4	
Dibromomethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	75-71-8	
1,1-Dichloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	75-34-3	
1,2-Dichloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	107-06-2	
1,1-Dichloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	156-60-5	
Dichlorofluoromethane	ND	ug/kg	732	1	04/21/18 11:05	04/22/18 01:16	75-43-4	
1,2-Dichloropropane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	78-87-5	
1,3-Dichloropropane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	142-28-9	
2,2-Dichloropropane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	594-20-7	
1,1-Dichloropropene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	60-29-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Sample: FD-SB-E1 (10-15 WM) Lab ID: 10427018008 Collected: 04/11/18 16:10 Received: 04/11/18 17:13 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Ethylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	366	1	04/21/18 11:05	04/22/18 01:16	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	98-82-8	
p-Isopropyltoluene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	99-87-6	
Methylene Chloride	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	366	1	04/21/18 11:05	04/22/18 01:16	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	1634-04-4	
Naphthalene	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	91-20-3	
n-Propylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	103-65-1	
Styrene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	79-34-5	
Tetrachloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	127-18-4	
Tetrahydrofuran	ND	ug/kg	2930	1	04/21/18 11:05	04/22/18 01:16	109-99-9	
Toluene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	79-00-5	
Trichloroethene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	79-01-6	
Trichlorofluoromethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	293	1	04/21/18 11:05	04/22/18 01:16	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	73.2	1	04/21/18 11:05	04/22/18 01:16	108-67-8	
Vinyl chloride	ND	ug/kg	29.3	1	04/21/18 11:05	04/22/18 01:16	75-01-4	
Xylene (Total)	ND	ug/kg	220	1	04/21/18 11:05	04/22/18 01:16	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/21/18 11:05	04/22/18 01:16	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/21/18 11:05	04/22/18 01:16	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125	1	04/21/18 11:05	04/22/18 01:16	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	113	50	04/18/18 10:45	04/19/18 14:10	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	21.2	mg/kg	1.0	1		04/26/18 09:11	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.39	mg/kg	0.31	1	04/20/18 10:25	04/20/18 13:45	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/18/18 14:45	04/19/18 22:06	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 141622 Analysis Method: EPA 1630 (1998)
 QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 559956 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/27/18 14:14	N3

METHOD BLANK: 559957 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/27/18 14:20	N3

METHOD BLANK: 559958 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/27/18 14:27	N3

LABORATORY CONTROL SAMPLE: 559959

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	99.7	116	117	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559960 559961

Parameter	Units	10427018004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual	
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD
Methyl Mercury	ng/g	ND	374	387	412	449	110	116	65-135	9	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559962 559963

Parameter	Units	10427291002 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual	
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD
Methyl Mercury	ng/g	ND	344	356	391	403	114	113	65-135	3	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 533563 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2898329 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/23/18 14:54	
a,a,a-Trifluorotoluene (S)	%.	98	80-150	04/23/18 14:54	

LABORATORY CONTROL SAMPLE & LCSD: 2898330

2898331

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	42.4	41.8	85	84	80-120	2	20	
a,a,a-Trifluorotoluene (S)	%.				99	98	80-150			

MATRIX SPIKE SAMPLE: 2899187

Parameter	Units	10427018001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	22.8	78.6	175	194	80-120	C0,M1
a,a,a-Trifluorotoluene (S)	%.				98	80-150	

SAMPLE DUPLICATE: 2899188

Parameter	Units	10427018003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%.	99	98	5		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532184

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890276

Matrix: Solid

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/15/18 17:59	

LABORATORY CONTROL SAMPLE: 2890277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.54	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890278 2890279

Parameter	Units	10427018001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.14	.72	.73	0.92	0.92	108	105	80-120	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532178 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890252 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.7	04/13/18 14:57	
Barium	mg/kg	ND	0.49	04/13/18 14:57	
Boron	mg/kg	ND	7.3	04/13/18 14:57	
Copper	mg/kg	ND	0.49	04/13/18 14:57	
Iron	mg/kg	ND	2.4	04/13/18 14:57	
Manganese	mg/kg	ND	0.24	04/13/18 14:57	
Nickel	mg/kg	ND	0.97	04/13/18 14:57	
Silver	mg/kg	ND	0.49	04/13/18 14:57	
Tin	mg/kg	ND	3.6	04/13/18 14:57	
Titanium	mg/kg	ND	1.2	04/13/18 14:57	
Zinc	mg/kg	ND	0.97	04/13/18 14:57	

LABORATORY CONTROL SAMPLE: 2890253

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	952	938	98	80-120	
Barium	mg/kg	47.6	48.9	103	80-120	
Boron	mg/kg	47.6	43.9	92	80-120	
Copper	mg/kg	47.6	47.5	100	80-120	
Iron	mg/kg	952	972	102	80-120	
Manganese	mg/kg	47.6	50.0	105	80-120	
Nickel	mg/kg	47.6	47.5	100	80-120	
Silver	mg/kg	23.8	22.4	94	80-120	
Tin	mg/kg	47.6	47.9	101	80-120	
Titanium	mg/kg	47.6	48.3	101	80-120	
Zinc	mg/kg	47.6	47.2	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890254 2890255

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427160001 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum	mg/kg	2780	5170	5170	7210	7390	86	89	75-125	3	20		
Barium	mg/kg	752	258	258	779	811	10	23	75-125	4	20	M1	
Boron	mg/kg	ND	258	258	237	240	89	90	75-125	1	20		
Copper	mg/kg	567	258	258	743	764	68	76	75-125	3	20	M1	
Iron	mg/kg	30200	5170	5170	25700	27900	-87	-45	75-125	8	20	P6	
Manganese	mg/kg	2080	258	258	2040	2130	-15	21	75-125	4	20	P6	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Parameter	Units	2890254		2890255		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Nickel	mg/kg	9.7	258	258	257	260	96	97	75-125	1	20		
Silver	mg/kg	3.2	129	129	121	123	91	93	75-125	2	20		
Tin	mg/kg	29.9	258	258	250	256	85	88	75-125	2	20		
Titanium	mg/kg	222	258	258	378	365	60	56	75-125	3	20	M1	
Zinc	mg/kg	810	258	258	854	892	17	32	75-125	4	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 437311

Analysis Method: EPA 6020

QC Batch Method: EPA 3050B

Analysis Description: 6020 MET

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2020384

Matrix: Solid

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.20	04/19/18 06:49	N2

LABORATORY CONTROL SAMPLE: 2020385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.9	3.9	102	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2020386 2020387

Parameter	Units	10427018004 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max		
			Spike Conc.	MS Spike Conc.	MS Result	MSD Result				RPD	RPD	Qual
Chromium	mg/kg	14.2	4.22	4.46	18.2	16.5	93	51	75-125	10	20	M0,N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532177 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890248 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.48	04/16/18 14:11	
Arsenic	mg/kg	ND	0.48	04/16/18 14:11	
Beryllium	mg/kg	ND	0.19	04/16/18 14:11	
Cadmium	mg/kg	ND	0.077	04/16/18 14:11	
Cobalt	mg/kg	ND	0.48	04/16/18 14:11	
Lead	mg/kg	ND	0.096	04/16/18 14:11	
Lithium	mg/kg	ND	0.48	04/16/18 14:11	
Selenium	mg/kg	ND	0.48	04/16/18 14:11	
Strontium	mg/kg	ND	0.48	04/16/18 14:11	
Vanadium	mg/kg	ND	0.96	04/16/18 14:11	

LABORATORY CONTROL SAMPLE: 2890249

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	46.5	98	80-120	
Arsenic	mg/kg	47.6	44.6	94	80-120	
Beryllium	mg/kg	47.6	51.0	107	80-120	
Cadmium	mg/kg	47.6	46.6	98	80-120	
Cobalt	mg/kg	47.6	46.1	97	80-120	
Lead	mg/kg	47.6	46.2	97	80-120	
Lithium	mg/kg	47.6	51.3	108	80-120	
Selenium	mg/kg	47.6	50.0	105	80-120	
Strontium	mg/kg	47.6	44.6	94	80-120	
Vanadium	mg/kg	47.6	45.7	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890250 2890251

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427154001 Result	Spike Conc.	Spike Conc.	Conc.								
Antimony	mg/kg	2.8	117	115	115	94.8	94.5	78	80	75-125	0	20	
Arsenic	mg/kg	29.6	117	115	115	133	135	88	92	75-125	1	20	
Beryllium	mg/kg	ND	117	115	115	105	103	89	90	75-125	1	20	
Cadmium	mg/kg	2.3	117	115	115	108	109	90	93	75-125	1	20	
Cobalt	mg/kg	4.4	117	115	115	112	113	92	95	75-125	1	20	
Lead	mg/kg	36.3	117	115	115	139	143	88	93	75-125	3	20	
Lithium	mg/kg	3.0	117	115	115	108	106	90	90	75-125	2	20	
Selenium	mg/kg	4.2	117	115	115	109	109	90	91	75-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Parameter	Units	2890250		2890251		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10427154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						MSD Result
Strontium	mg/kg	195	117	115	283	304	75	95	75-125	7	20
Vanadium	mg/kg	14.1	117	115	121	123	91	95	75-125	2	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532990

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

SAMPLE DUPLICATE: 2894446

Parameter	Units	10427653001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.5	10.1	3	30	

SAMPLE DUPLICATE: 2894447

Parameter	Units	10427654004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.2	4.1	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 533507

Analysis Method: EPA 8260B

QC Batch Method: EPA 5035/5030B

Analysis Description: 8260B MSV 5030 Med Level

Associated Lab Samples: 10427018001

METHOD BLANK: 2898020

Matrix: Solid

Associated Lab Samples: 10427018001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/20/18 22:52	
1,1-Dichloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,1-Dichloroethene	ug/kg	ND	50.0	04/20/18 22:52	
1,1-Dichloropropene	ug/kg	ND	50.0	04/20/18 22:52	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,2,3-Trichloropropane	ug/kg	ND	200	04/20/18 22:52	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/20/18 22:52	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/20/18 22:52	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,2-Dichloroethane	ug/kg	ND	50.0	04/20/18 22:52	
1,2-Dichloropropane	ug/kg	ND	50.0	04/20/18 22:52	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
1,3-Dichloropropane	ug/kg	ND	50.0	04/20/18 22:52	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
2,2-Dichloropropane	ug/kg	ND	200	04/20/18 22:52	
2-Butanone (MEK)	ug/kg	ND	250	04/20/18 22:52	
2-Chlorotoluene	ug/kg	ND	50.0	04/20/18 22:52	
4-Chlorotoluene	ug/kg	ND	50.0	04/20/18 22:52	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/20/18 22:52	
Acetone	ug/kg	ND	1000	04/20/18 22:52	
Allyl chloride	ug/kg	ND	200	04/20/18 22:52	
Benzene	ug/kg	ND	20.0	04/20/18 22:52	
Bromobenzene	ug/kg	ND	50.0	04/20/18 22:52	
Bromochloromethane	ug/kg	ND	50.0	04/20/18 22:52	
Bromodichloromethane	ug/kg	ND	50.0	04/20/18 22:52	
Bromoform	ug/kg	ND	200	04/20/18 22:52	
Bromomethane	ug/kg	ND	500	04/20/18 22:52	
Carbon tetrachloride	ug/kg	ND	50.0	04/20/18 22:52	
Chlorobenzene	ug/kg	ND	50.0	04/20/18 22:52	
Chloroethane	ug/kg	ND	500	04/20/18 22:52	
Chloroform	ug/kg	ND	50.0	04/20/18 22:52	
Chloromethane	ug/kg	ND	200	04/20/18 22:52	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/20/18 22:52	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/20/18 22:52	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

METHOD BLANK: 2898020

Matrix: Solid

Associated Lab Samples: 10427018001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/20/18 22:52	
Dibromomethane	ug/kg	ND	50.0	04/20/18 22:52	
Dichlorodifluoromethane	ug/kg	ND	200	04/20/18 22:52	
Dichlorofluoromethane	ug/kg	ND	500	04/20/18 22:52	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/20/18 22:52	
Ethylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/20/18 22:52	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/20/18 22:52	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/20/18 22:52	
Methylene Chloride	ug/kg	ND	200	04/20/18 22:52	
n-Butylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
n-Propylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
Naphthalene	ug/kg	ND	200	04/20/18 22:52	
p-Isopropyltoluene	ug/kg	ND	50.0	04/20/18 22:52	
sec-Butylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
Styrene	ug/kg	ND	50.0	04/20/18 22:52	
tert-Butylbenzene	ug/kg	ND	50.0	04/20/18 22:52	
Tetrachloroethene	ug/kg	ND	50.0	04/20/18 22:52	
Tetrahydrofuran	ug/kg	ND	2000	04/20/18 22:52	
Toluene	ug/kg	ND	50.0	04/20/18 22:52	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/20/18 22:52	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/20/18 22:52	
Trichloroethene	ug/kg	ND	50.0	04/20/18 22:52	
Trichlorofluoromethane	ug/kg	ND	200	04/20/18 22:52	
Vinyl chloride	ug/kg	ND	20.0	04/20/18 22:52	
Xylene (Total)	ug/kg	ND	150	04/20/18 22:52	
1,2-Dichloroethane-d4 (S)	%	97	75-125	04/20/18 22:52	
4-Bromofluorobenzene (S)	%	101	75-125	04/20/18 22:52	
Toluene-d8 (S)	%	96	75-125	04/20/18 22:52	

LABORATORY CONTROL SAMPLE & LCSD: 2898021

2898022

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	843	866	84	87	59-125	3	20	
1,1,1-Trichloroethane	ug/kg	1000	903	927	90	93	59-125	3	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	870	874	87	87	58-125	0	20	
1,1,2-Trichloroethane	ug/kg	1000	853	868	85	87	64-125	2	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	878	882	88	88	65-125	0	20	
1,1-Dichloroethane	ug/kg	1000	906	939	91	94	63-125	4	20	
1,1-Dichloroethene	ug/kg	1000	918	946	92	95	59-125	3	20	
1,1-Dichloropropene	ug/kg	1000	899	933	90	93	64-125	4	20	
1,2,3-Trichlorobenzene	ug/kg	1000	778	800	78	80	55-126	3	20	
1,2,3-Trichloropropane	ug/kg	1000	859	778	86	78	62-125	10	20	
1,2,4-Trichlorobenzene	ug/kg	1000	810	827	81	83	62-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE & LCSD: 2898021		2898022								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	857	854	86	85	59-125	0	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1850	1870	74	75	54-125	1	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	852	862	85	86	64-125	1	20	
1,2-Dichlorobenzene	ug/kg	1000	812	814	81	81	63-125	0	20	
1,2-Dichloroethane	ug/kg	1000	837	850	84	85	57-125	2	20	
1,2-Dichloropropane	ug/kg	1000	914	903	91	90	67-125	1	20	
1,3,5-Trimethylbenzene	ug/kg	1000	893	847	89	85	59-125	5	20	
1,3-Dichlorobenzene	ug/kg	1000	763	776	76	78	64-125	2	20	
1,3-Dichloropropane	ug/kg	1000	873	877	87	88	64-125	1	20	
1,4-Dichlorobenzene	ug/kg	1000	852	811	85	81	63-125	5	20	
2,2-Dichloropropane	ug/kg	1000	925	938	93	94	37-126	1	20	
2-Butanone (MEK)	ug/kg	5000	4410	4620	88	92	48-125	5	20	
2-Chlorotoluene	ug/kg	1000	811	817	81	82	62-125	1	20	
4-Chlorotoluene	ug/kg	1000	851	821	85	82	63-125	4	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4420	4660	88	93	52-135	5	20	
Acetone	ug/kg	5000	4790	5000	96	100	65-125	4	20	
Allyl chloride	ug/kg	1000	943	989	94	99	52-125	5	20	
Benzene	ug/kg	1000	899	910	90	91	61-125	1	20	
Bromobenzene	ug/kg	1000	797	841	80	84	64-125	5	20	
Bromochloromethane	ug/kg	1000	886	892	89	89	65-125	1	20	
Bromodichloromethane	ug/kg	1000	870	864	87	86	57-125	1	20	
Bromoform	ug/kg	1000	718	746	72	75	57-125	4	20	
Bromomethane	ug/kg	1000	867	906	87	91	60-125	4	20	
Carbon tetrachloride	ug/kg	1000	887	893	89	89	58-125	1	20	
Chlorobenzene	ug/kg	1000	839	864	84	86	66-125	3	20	
Chloroethane	ug/kg	1000	882	919	88	92	62-125	4	20	
Chloroform	ug/kg	1000	829	844	83	84	59-125	2	20	
Chloromethane	ug/kg	1000	875	920	88	92	50-125	5	20	
cis-1,2-Dichloroethene	ug/kg	1000	882	885	88	89	61-125	0	20	
cis-1,3-Dichloropropene	ug/kg	1000	885	879	89	88	61-125	1	20	
Dibromochloromethane	ug/kg	1000	769	800	77	80	60-125	4	20	
Dibromomethane	ug/kg	1000	872	852	87	85	69-125	2	20	
Dichlorodifluoromethane	ug/kg	1000	707	723	71	72	38-125	2	20	
Dichlorofluoromethane	ug/kg	1000	865	883	86	88	67-125	2	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1800	1500	180	150	60-125	19	20 L3	
Ethylbenzene	ug/kg	1000	866	868	87	87	62-125	0	20	
Hexachloro-1,3-butadiene	ug/kg	1000	754	772	75	77	56-125	2	20	
Isopropylbenzene (Cumene)	ug/kg	1000	895	896	89	90	65-125	0	20	
Methyl-tert-butyl ether	ug/kg	1000	891	909	89	91	59-125	2	20	
Methylene Chloride	ug/kg	1000	959	959	96	96	64-125	0	20	
n-Butylbenzene	ug/kg	1000	878	861	88	86	59-125	2	20	
n-Propylbenzene	ug/kg	1000	853	868	85	87	61-125	2	20	
Naphthalene	ug/kg	1000	876	863	88	86	53-125	1	20	
p-Isopropyltoluene	ug/kg	1000	867	849	87	85	63-125	2	20	
sec-Butylbenzene	ug/kg	1000	899	881	90	88	62-125	2	20	
Styrene	ug/kg	1000	858	881	86	88	66-125	3	20	
tert-Butylbenzene	ug/kg	1000	840	856	84	86	64-125	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE & LCSD: 2898021

2898022

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Tetrachloroethene	ug/kg	1000	857	870	86	87	67-125	2	20	
Tetrahydrofuran	ug/kg	10000	9790	10200	98	102	62-125	4	20	
Toluene	ug/kg	1000	880	859	88	86	61-125	2	20	
trans-1,2-Dichloroethene	ug/kg	1000	966	977	97	98	64-125	1	20	
trans-1,3-Dichloropropene	ug/kg	1000	890	898	89	90	56-125	1	20	
Trichloroethene	ug/kg	1000	864	847	86	85	67-125	2	20	
Trichlorofluoromethane	ug/kg	1000	833	892	83	89	65-125	7	20	
Vinyl chloride	ug/kg	1000	926	963	93	96	57-125	4	20	
Xylene (Total)	ug/kg	3000	2620	2670	87	89	62-125	2	20	
1,2-Dichloroethane-d4 (S)	%				97	99	75-125			
4-Bromofluorobenzene (S)	%				98	97	75-125			
Toluene-d8 (S)	%				100	100	75-125			

MATRIX SPIKE SAMPLE: 2898023

Parameter	Units	10427374003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	<0.057 mg/kg	1110	1180	107	64-146	
1,1,1-Trichloroethane	ug/kg	<0.057 mg/kg	1110	1230	111	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	<0.057 mg/kg	1110	1210	110	36-150	
1,1,2-Trichloroethane	ug/kg	<0.057 mg/kg	1110	1190	107	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	<0.23 mg/kg	1110	1170	106	60-142	
1,1-Dichloroethane	ug/kg	<0.057 mg/kg	1110	1250	113	57-140	
1,1-Dichloroethene	ug/kg	<0.057 mg/kg	1110	1240	112	59-139	
1,1-Dichloropropene	ug/kg	<0.057 mg/kg	1110	1250	113	61-142	
1,2,3-Trichlorobenzene	ug/kg	<0.057 mg/kg	1110	1120	101	69-150	
1,2,3-Trichloropropane	ug/kg	<0.23 mg/kg	1110	1130	102	64-150	
1,2,4-Trichlorobenzene	ug/kg	<0.057 mg/kg	1110	1150	103	71-149	
1,2,4-Trimethylbenzene	ug/kg	<0.057 mg/kg	1110	1190	106	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	<0.57 mg/kg	2770	2570	93	61-150	
1,2-Dibromoethane (EDB)	ug/kg	<0.057 mg/kg	1110	1190	107	67-147	
1,2-Dichlorobenzene	ug/kg	<0.057 mg/kg	1110	1140	103	70-142	
1,2-Dichloroethane	ug/kg	<0.057 mg/kg	1110	1150	104	58-132	
1,2-Dichloropropane	ug/kg	<0.057 mg/kg	1110	1230	111	64-144	
1,3,5-Trimethylbenzene	ug/kg	<0.057 mg/kg	1110	1190	108	71-146	
1,3-Dichlorobenzene	ug/kg	<0.057 mg/kg	1110	1100	100	71-142	
1,3-Dichloropropane	ug/kg	<0.057 mg/kg	1110	1180	107	68-140	
1,4-Dichlorobenzene	ug/kg	<0.057 mg/kg	1110	1090	99	68-142	
2,2-Dichloropropane	ug/kg	<0.23 mg/kg	1110	1240	112	34-150	
2-Butanone (MEK)	ug/kg	<0.28 mg/kg	5540	6550	118	51-150	
2-Chlorotoluene	ug/kg	<0.057 mg/kg	1110	1130	102	66-144	
4-Chlorotoluene	ug/kg	<0.057 mg/kg	1110	1150	104	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	<0.28 mg/kg	5540	6100	110	63-150	
Acetone	ug/kg	<1.1 mg/kg	5540	7130	129	54-150	
Allyl chloride	ug/kg	<0.23 mg/kg	1110	1320	119	53-135	
Benzene	ug/kg	<0.023 mg/kg	1110	1240	111	65-135	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

MATRIX SPIKE SAMPLE: 2898023		10427374003	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	<0.057 mg/kg	1110	1150	104	71-141	
Bromochloromethane	ug/kg	<0.057 mg/kg	1110	1220	110	62-145	
Bromodichloromethane	ug/kg	<0.057 mg/kg	1110	1220	110	59-148	
Bromoform	ug/kg	<0.23 mg/kg	1110	1050	95	57-145	
Bromomethane	ug/kg	<0.57 mg/kg	1110	1110	100	51-129	
Carbon tetrachloride	ug/kg	<0.057 mg/kg	1110	1210	109	55-144	
Chlorobenzene	ug/kg	<0.057 mg/kg	1110	1160	105	70-142	
Chloroethane	ug/kg	<0.57 mg/kg	1110	1120	101	61-135	
Chloroform	ug/kg	<0.057 mg/kg	1110	1140	102	58-135	
Chloromethane	ug/kg	<0.23 mg/kg	1110	1020	92	37-125	
cis-1,2-Dichloroethene	ug/kg	<0.057 mg/kg	1110	1240	112	60-138	
cis-1,3-Dichloropropene	ug/kg	<0.057 mg/kg	1110	1230	111	62-142	
Dibromochloromethane	ug/kg	<0.23 mg/kg	1110	1080	97	65-141	
Dibromomethane	ug/kg	<0.057 mg/kg	1110	1210	109	72-150	
Dichlorodifluoromethane	ug/kg	<0.23 mg/kg	1110	663	60	30-125	
Dichlorofluoromethane	ug/kg	<0.57 mg/kg	1110	1050	95	62-148	
Diethyl ether (Ethyl ether)	ug/kg	<0.23 mg/kg	1110	2520	227	62-135	MO
Ethylbenzene	ug/kg	<0.057 mg/kg	1110	1190	107	72-138	
Hexachloro-1,3-butadiene	ug/kg	<0.28 mg/kg	1110	1130	102	38-150	
Isopropylbenzene (Cumene)	ug/kg	<0.057 mg/kg	1110	1220	111	75-148	
Methyl-tert-butyl ether	ug/kg	<0.057 mg/kg	1110	1230	111	63-139	
Methylene Chloride	ug/kg	<0.23 mg/kg	1110	1340	119	58-135	
n-Butylbenzene	ug/kg	<0.057 mg/kg	1110	1220	110	63-150	
n-Propylbenzene	ug/kg	<0.057 mg/kg	1110	1190	107	70-146	
Naphthalene	ug/kg	<0.23 mg/kg	1110	1220	109	63-150	
p-Isopropyltoluene	ug/kg	<0.057 mg/kg	1110	1180	107	72-150	
sec-Butylbenzene	ug/kg	<0.057 mg/kg	1110	1230	111	66-150	
Styrene	ug/kg	<0.057 mg/kg	1110	1250	113	72-146	
tert-Butylbenzene	ug/kg	<0.057 mg/kg	1110	1180	106	71-148	
Tetrachloroethene	ug/kg	<0.057 mg/kg	1110	1170	105	70-150	
Tetrahydrofuran	ug/kg	<2.3 mg/kg	11100	13600	123	62-150	
Toluene	ug/kg	<0.057 mg/kg	1110	1200	107	65-142	
trans-1,2-Dichloroethene	ug/kg	<0.057 mg/kg	1110	1290	116	55-141	
trans-1,3-Dichloropropene	ug/kg	<0.057 mg/kg	1110	1220	110	57-147	
Trichloroethene	ug/kg	<0.057 mg/kg	1110	1170	106	62-150	
Trichlorofluoromethane	ug/kg	<0.23 mg/kg	1110	987	89	51-150	
Vinyl chloride	ug/kg	<0.023 mg/kg	1110	1080	97	45-132	
Xylene (Total)	ug/kg	<0.17 mg/kg	3320	3640	109	75-140	
1,2-Dichloroethane-d4 (S)	%				100	75-125	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				100	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

SAMPLE DUPLICATE: 2898024

Parameter	Units	10427374004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1,1-Trichloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1,2-Trichloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	<0.24 mg/kg	ND		30	
1,1-Dichloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,1-Dichloroethene	ug/kg	<0.059 mg/kg	ND		30	
1,1-Dichloropropene	ug/kg	<0.059 mg/kg	ND		30	
1,2,3-Trichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
1,2,3-Trichloropropane	ug/kg	<0.24 mg/kg	ND		30	
1,2,4-Trichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
1,2,4-Trimethylbenzene	ug/kg	0.14 mg/kg	202	36	30	D6
1,2-Dibromo-3-chloropropane	ug/kg	<0.59 mg/kg	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	<0.059 mg/kg	ND		30	
1,2-Dichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
1,2-Dichloroethane	ug/kg	<0.059 mg/kg	ND		30	
1,2-Dichloropropane	ug/kg	<0.059 mg/kg	ND		30	
1,3,5-Trimethylbenzene	ug/kg	<0.059 mg/kg	35.7J		30	
1,3-Dichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
1,3-Dichloropropane	ug/kg	<0.059 mg/kg	ND		30	
1,4-Dichlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
2,2-Dichloropropane	ug/kg	<0.24 mg/kg	ND		30	
2-Butanone (MEK)	ug/kg	<0.29 mg/kg	ND		30	
2-Chlorotoluene	ug/kg	<0.059 mg/kg	ND		30	
4-Chlorotoluene	ug/kg	<0.059 mg/kg	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	<0.29 mg/kg	ND		30	
Acetone	ug/kg	<1.2 mg/kg	ND		30	
Allyl chloride	ug/kg	<0.24 mg/kg	ND		30	
Benzene	ug/kg	0.035 mg/kg	52.0	39	30	D6
Bromobenzene	ug/kg	<0.059 mg/kg	ND		30	
Bromochloromethane	ug/kg	<0.059 mg/kg	ND		30	
Bromodichloromethane	ug/kg	<0.059 mg/kg	ND		30	
Bromoform	ug/kg	<0.24 mg/kg	ND		30	
Bromomethane	ug/kg	<0.59 mg/kg	ND		30	
Carbon tetrachloride	ug/kg	<0.059 mg/kg	ND		30	
Chlorobenzene	ug/kg	<0.059 mg/kg	ND		30	
Chloroethane	ug/kg	<0.59 mg/kg	ND		30	
Chloroform	ug/kg	<0.059 mg/kg	ND		30	
Chloromethane	ug/kg	<0.24 mg/kg	ND		30	
cis-1,2-Dichloroethene	ug/kg	<0.059 mg/kg	ND		30	
cis-1,3-Dichloropropene	ug/kg	<0.059 mg/kg	ND		30	
Dibromochloromethane	ug/kg	<0.24 mg/kg	ND		30	
Dibromomethane	ug/kg	<0.059 mg/kg	ND		30	
Dichlorodifluoromethane	ug/kg	<0.24 mg/kg	ND		30	
Dichlorofluoromethane	ug/kg	<0.59 mg/kg	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	<0.24 mg/kg	ND		30	
Ethylbenzene	ug/kg	0.074 mg/kg	83.3	12	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

SAMPLE DUPLICATE: 2898024

Parameter	Units	10427374004 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	<0.29 mg/kg	ND		30	
Isopropylbenzene (Cumene)	ug/kg	<0.059 mg/kg	55.5J		30	
Methyl-tert-butyl ether	ug/kg	<0.059 mg/kg	ND		30	
Methylene Chloride	ug/kg	<0.24 mg/kg	30.8J		30	
n-Butylbenzene	ug/kg	<0.059 mg/kg	23.8J		30	
n-Propylbenzene	ug/kg	0.059 mg/kg	64.8	9	30	
Naphthalene	ug/kg	<0.24 mg/kg	292		30	
p-Isopropyltoluene	ug/kg	<0.059 mg/kg	18.7J		30	
sec-Butylbenzene	ug/kg	<0.059 mg/kg	22.1J		30	
Styrene	ug/kg	<0.059 mg/kg	ND		30	
tert-Butylbenzene	ug/kg	<0.059 mg/kg	ND		30	
Tetrachloroethene	ug/kg	<0.059 mg/kg	ND		30	
Tetrahydrofuran	ug/kg	<2.4 mg/kg	ND		30	
Toluene	ug/kg	0.20 mg/kg	247	19	30	
trans-1,2-Dichloroethene	ug/kg	<0.059 mg/kg	ND		30	
trans-1,3-Dichloropropene	ug/kg	<0.059 mg/kg	ND		30	
Trichloroethene	ug/kg	<0.059 mg/kg	ND		30	
Trichlorofluoromethane	ug/kg	<0.24 mg/kg	ND		30	
Vinyl chloride	ug/kg	<0.024 mg/kg	ND		30	
Xylene (Total)	ug/kg	0.46 mg/kg	588	24	30	
1,2-Dichloroethane-d4 (S)	%.	97	97	1		
4-Bromofluorobenzene (S)	%.	102	102	1		
Toluene-d8 (S)	%.	97	97	1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 533615 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
 Associated Lab Samples: 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2898727 Matrix: Solid
 Associated Lab Samples: 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/21/18 16:19	
1,1-Dichloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,1-Dichloroethene	ug/kg	ND	50.0	04/21/18 16:19	
1,1-Dichloropropene	ug/kg	ND	50.0	04/21/18 16:19	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,2,3-Trichloropropane	ug/kg	ND	200	04/21/18 16:19	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/21/18 16:19	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/21/18 16:19	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,2-Dichloroethane	ug/kg	ND	50.0	04/21/18 16:19	
1,2-Dichloropropane	ug/kg	ND	50.0	04/21/18 16:19	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
1,3-Dichloropropane	ug/kg	ND	50.0	04/21/18 16:19	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
2,2-Dichloropropane	ug/kg	ND	200	04/21/18 16:19	
2-Butanone (MEK)	ug/kg	ND	250	04/21/18 16:19	
2-Chlorotoluene	ug/kg	ND	50.0	04/21/18 16:19	
4-Chlorotoluene	ug/kg	ND	50.0	04/21/18 16:19	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/21/18 16:19	
Acetone	ug/kg	ND	1000	04/21/18 16:19	
Allyl chloride	ug/kg	ND	200	04/21/18 16:19	
Benzene	ug/kg	ND	20.0	04/21/18 16:19	
Bromobenzene	ug/kg	ND	50.0	04/21/18 16:19	
Bromochloromethane	ug/kg	ND	50.0	04/21/18 16:19	
Bromodichloromethane	ug/kg	ND	50.0	04/21/18 16:19	
Bromoform	ug/kg	ND	200	04/21/18 16:19	MN
Bromomethane	ug/kg	ND	500	04/21/18 16:19	
Carbon tetrachloride	ug/kg	ND	50.0	04/21/18 16:19	
Chlorobenzene	ug/kg	ND	50.0	04/21/18 16:19	
Chloroethane	ug/kg	ND	500	04/21/18 16:19	
Chloroform	ug/kg	ND	50.0	04/21/18 16:19	
Chloromethane	ug/kg	ND	200	04/21/18 16:19	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/21/18 16:19	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/21/18 16:19	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

METHOD BLANK: 2898727

Matrix: Solid

Associated Lab Samples: 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/21/18 16:19	
Dibromomethane	ug/kg	ND	50.0	04/21/18 16:19	
Dichlorodifluoromethane	ug/kg	ND	200	04/21/18 16:19	
Dichlorofluoromethane	ug/kg	ND	500	04/21/18 16:19	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/21/18 16:19	
Ethylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/21/18 16:19	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/21/18 16:19	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/21/18 16:19	
Methylene Chloride	ug/kg	ND	200	04/21/18 16:19	
n-Butylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
n-Propylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
Naphthalene	ug/kg	ND	200	04/21/18 16:19	
p-Isopropyltoluene	ug/kg	ND	50.0	04/21/18 16:19	
sec-Butylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
Styrene	ug/kg	ND	50.0	04/21/18 16:19	
tert-Butylbenzene	ug/kg	ND	50.0	04/21/18 16:19	
Tetrachloroethene	ug/kg	ND	50.0	04/21/18 16:19	
Tetrahydrofuran	ug/kg	ND	2000	04/21/18 16:19	
Toluene	ug/kg	ND	50.0	04/21/18 16:19	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/21/18 16:19	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/21/18 16:19	
Trichloroethene	ug/kg	ND	50.0	04/21/18 16:19	
Trichlorofluoromethane	ug/kg	ND	200	04/21/18 16:19	
Vinyl chloride	ug/kg	ND	20.0	04/21/18 16:19	
Xylene (Total)	ug/kg	ND	150	04/21/18 16:19	
1,2-Dichloroethane-d4 (S)	%	96	75-125	04/21/18 16:19	
4-Bromofluorobenzene (S)	%	101	75-125	04/21/18 16:19	
Toluene-d8 (S)	%	97	75-125	04/21/18 16:19	

LABORATORY CONTROL SAMPLE & LCSD: 2898728

2898729

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	1080	1030	108	103	59-125	5	20	
1,1,1-Trichloroethane	ug/kg	1000	1120	1040	112	104	59-125	8	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	991	956	99	96	58-125	4	20	
1,1,2-Trichloroethane	ug/kg	1000	1030	970	103	97	64-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	1080	940	108	94	65-125	14	20	
1,1-Dichloroethane	ug/kg	1000	1060	968	106	97	63-125	9	20	
1,1-Dichloroethene	ug/kg	1000	1070	966	107	97	59-125	10	20	
1,1-Dichloropropene	ug/kg	1000	1230	1100	123	110	64-125	10	20	
1,2,3-Trichlorobenzene	ug/kg	1000	992	952	99	95	55-126	4	20	
1,2,3-Trichloropropane	ug/kg	1000	1000	966	100	97	62-125	3	20	
1,2,4-Trichlorobenzene	ug/kg	1000	1000	969	100	97	62-125	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE & LCS:		2898728		2898729							
Parameter	Units	Spike Conc.	LCS Result	LCS Result	LCS % Rec	LCS % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,2,4-Trimethylbenzene	ug/kg	1000	1000	961	100	96	59-125	4	20		
1,2-Dibromo-3-chloropropane	ug/kg	2500	2500	2400	100	96	54-125	4	20		
1,2-Dibromoethane (EDB)	ug/kg	1000	1120	1020	112	102	64-125	9	20		
1,2-Dichlorobenzene	ug/kg	1000	1030	972	103	97	63-125	5	20		
1,2-Dichloroethane	ug/kg	1000	983	905	98	90	57-125	8	20		
1,2-Dichloropropane	ug/kg	1000	1020	952	102	95	67-125	7	20		
1,3,5-Trimethylbenzene	ug/kg	1000	1020	982	102	98	59-125	4	20		
1,3-Dichlorobenzene	ug/kg	1000	1020	956	102	96	64-125	7	20		
1,3-Dichloropropane	ug/kg	1000	1020	969	102	97	64-125	5	20		
1,4-Dichlorobenzene	ug/kg	1000	961	927	96	93	63-125	4	20		
2,2-Dichloropropane	ug/kg	1000	1060	990	106	99	37-126	7	20		
2-Butanone (MEK)	ug/kg	5000	5780	5160	116	103	48-125	11	20		
2-Chlorotoluene	ug/kg	1000	1020	966	102	97	62-125	5	20		
4-Chlorotoluene	ug/kg	1000	1020	950	102	95	63-125	7	20		
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4950	4640	99	93	52-135	6	20		
Acetone	ug/kg	5000	6410	5530	128	111	65-125	15	20	L3	
Allyl chloride	ug/kg	1000	1050	946	105	95	52-125	11	20		
Benzene	ug/kg	1000	1070	989	107	99	61-125	8	20		
Bromobenzene	ug/kg	1000	1080	1020	108	102	64-125	6	20		
Bromochloromethane	ug/kg	1000	1070	934	107	93	65-125	14	20		
Bromodichloromethane	ug/kg	1000	1090	1010	109	101	57-125	7	20		
Bromoform	ug/kg	1000	1070	1000	107	100	57-125	7	20		
Bromomethane	ug/kg	1000	887	802	89	80	60-125	10	20		
Carbon tetrachloride	ug/kg	1000	1120	1030	112	103	58-125	9	20		
Chlorobenzene	ug/kg	1000	1030	955	103	95	66-125	8	20		
Chloroethane	ug/kg	1000	898	849	90	85	62-125	6	20		
Chloroform	ug/kg	1000	997	901	100	90	59-125	10	20		
Chloromethane	ug/kg	1000	831	776	83	78	50-125	7	20		
cis-1,2-Dichloroethene	ug/kg	1000	1050	952	105	95	61-125	10	20		
cis-1,3-Dichloropropene	ug/kg	1000	1100	1030	110	103	61-125	7	20		
Dibromochloromethane	ug/kg	1000	1010	943	101	94	60-125	7	20		
Dibromomethane	ug/kg	1000	1110	1000	111	100	69-125	11	20		
Dichlorodifluoromethane	ug/kg	1000	717	630	72	63	38-125	13	20		
Dichlorofluoromethane	ug/kg	1000	1000	883	100	88	67-125	12	20		
Diethyl ether (Ethyl ether)	ug/kg	1000	2280	2050	228	205	60-125	11	20	L3,SS	
Ethylbenzene	ug/kg	1000	1070	989	107	99	62-125	8	20		
Hexachloro-1,3-butadiene	ug/kg	1000	1070	1010	107	101	56-125	5	20		
Isopropylbenzene (Cumene)	ug/kg	1000	1100	1030	110	103	65-125	6	20		
Methyl-tert-butyl ether	ug/kg	1000	965	891	97	89	59-125	8	20		
Methylene Chloride	ug/kg	1000	978	908	98	91	64-125	7	20		
n-Butylbenzene	ug/kg	1000	1050	1020	105	102	59-125	3	20		
n-Propylbenzene	ug/kg	1000	1060	987	106	99	61-125	7	20		
Naphthalene	ug/kg	1000	995	970	99	97	53-125	3	20		
p-Isopropyltoluene	ug/kg	1000	1060	1000	106	100	63-125	6	20		
sec-Butylbenzene	ug/kg	1000	1020	980	102	98	62-125	4	20		
Styrene	ug/kg	1000	1030	994	103	99	66-125	3	20		
tert-Butylbenzene	ug/kg	1000	1030	984	103	98	64-125	4	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE & LCSD: 2898728

2898729

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Tetrachloroethene	ug/kg	1000	1130	1030	113	103	67-125	10	20	
Tetrahydrofuran	ug/kg	10000	10600	9790	106	98	62-125	8	20	
Toluene	ug/kg	1000	988	931	99	93	61-125	6	20	
trans-1,2-Dichloroethene	ug/kg	1000	1110	1010	111	101	64-125	10	20	
trans-1,3-Dichloropropene	ug/kg	1000	1060	1000	106	100	56-125	6	20	
Trichloroethene	ug/kg	1000	1130	1030	113	103	67-125	9	20	
Trichlorofluoromethane	ug/kg	1000	1050	949	105	95	65-125	10	20	
Vinyl chloride	ug/kg	1000	964	875	96	88	57-125	10	20	
Xylene (Total)	ug/kg	3000	3080	2900	103	97	62-125	6	20	
1,2-Dichloroethane-d4 (S)	%				97	98	75-125			
4-Bromofluorobenzene (S)	%				97	100	75-125			
Toluene-d8 (S)	%				99	100	75-125			

MATRIX SPIKE SAMPLE: 2898730

Parameter	Units	10427790001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	1130	1150	102	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1130	1230	109	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1130	1240	110	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1130	1190	106	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1130	1160	103	60-142	
1,1-Dichloroethane	ug/kg	ND	1130	1270	113	57-140	
1,1-Dichloroethene	ug/kg	ND	1130	1270	113	59-139	
1,1-Dichloropropene	ug/kg	ND	1130	1240	111	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1130	1090	97	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1130	1170	104	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1130	1130	101	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1130	1160	103	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2810	2470	88	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1130	1170	105	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1130	1120	100	70-142	
1,2-Dichloroethane	ug/kg	ND	1130	1140	102	58-132	
1,2-Dichloropropane	ug/kg	ND	1130	1260	112	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1130	1210	108	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1130	1100	98	71-142	
1,3-Dichloropropane	ug/kg	ND	1130	1180	105	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1130	1130	101	68-142	
2,2-Dichloropropane	ug/kg	ND	1130	1330	118	34-150	
2-Butanone (MEK)	ug/kg	ND	5620	6160	110	51-150	
2-Chlorotoluene	ug/kg	ND	1130	1100	98	66-144	
4-Chlorotoluene	ug/kg	ND	1130	1150	102	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5620	6050	108	63-150	
Acetone	ug/kg	ND	5620	6420	114	54-150	
Allyl chloride	ug/kg	ND	1130	1310	117	53-135	
Benzene	ug/kg	ND	1130	1250	111	65-135	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

MATRIX SPIKE SAMPLE: 2898730		10427790001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1130	1150	102	71-141	
Bromochloromethane	ug/kg	ND	1130	1210	107	62-145	
Bromodichloromethane	ug/kg	ND	1130	1200	107	59-148	
Bromoform	ug/kg	ND	1130	994	88	57-145	
Bromomethane	ug/kg	ND	1130	1090	97	51-129	
Carbon tetrachloride	ug/kg	ND	1130	1200	107	55-144	
Chlorobenzene	ug/kg	ND	1130	1150	102	70-142	
Chloroethane	ug/kg	ND	1130	1160	103	61-135	
Chloroform	ug/kg	ND	1130	1130	100	58-135	
Chloromethane	ug/kg	ND	1130	1100	98	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1130	1210	107	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1130	1220	109	62-142	
Dibromochloromethane	ug/kg	ND	1130	1050	93	65-141	
Dibromomethane	ug/kg	ND	1130	1180	105	72-150	
Dichlorodifluoromethane	ug/kg	ND	1130	785	70	30-125	
Dichlorofluoromethane	ug/kg	ND	1130	1090	97	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1130	2490	221	62-135	M0,SS
Ethylbenzene	ug/kg	ND	1130	1170	104	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1130	1030	91	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1130	1240	110	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1130	1250	112	63-139	
Methylene Chloride	ug/kg	ND	1130	1280	114	58-135	
n-Butylbenzene	ug/kg	ND	1130	1210	108	63-150	
n-Propylbenzene	ug/kg	ND	1130	1200	107	70-146	
Naphthalene	ug/kg	ND	1130	1170	104	63-150	
p-Isopropyltoluene	ug/kg	ND	1130	1190	106	72-150	
sec-Butylbenzene	ug/kg	ND	1130	1250	111	66-150	
Styrene	ug/kg	ND	1130	1220	109	72-146	
tert-Butylbenzene	ug/kg	ND	1130	1170	104	71-148	
Tetrachloroethene	ug/kg	ND	1130	1180	105	70-150	
Tetrahydrofuran	ug/kg	ND	11300	12900	115	62-150	
Toluene	ug/kg	ND	1130	1180	105	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1130	1290	115	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1130	1210	107	57-147	
Trichloroethene	ug/kg	ND	1130	1210	108	62-150	
Trichlorofluoromethane	ug/kg	ND	1130	1080	96	51-150	
Vinyl chloride	ug/kg	ND	1130	1160	103	45-132	
Xylene (Total)	ug/kg	ND	3370	3640	108	75-140	
1,2-Dichloroethane-d4 (S)	%				99	75-125	
4-Bromofluorobenzene (S)	%				103	75-125	
Toluene-d8 (S)	%				98	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

SAMPLE DUPLICATE: 2898731

Parameter	Units	10427790002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

SAMPLE DUPLICATE: 2898731

Parameter	Units	10427790002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	97	97	1		
4-Bromofluorobenzene (S)	%.	99	101	1		
Toluene-d8 (S)	%.	97	97	1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532491 Analysis Method: EPA 8081B
 QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2891843 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/16/18 21:16	
4,4'-DDE	ug/kg	ND	3.3	04/16/18 21:16	
4,4'-DDT	ug/kg	ND	3.3	04/16/18 21:16	
Aldrin	ug/kg	ND	1.7	04/16/18 21:16	
alpha-BHC	ug/kg	ND	1.7	04/16/18 21:16	
alpha-Chlordane	ug/kg	ND	1.7	04/16/18 21:16	
beta-BHC	ug/kg	ND	1.7	04/16/18 21:16	
Chlordane (Technical)	ug/kg	ND	16.7	04/16/18 21:16	
delta-BHC	ug/kg	ND	1.7	04/16/18 21:16	
Dieldrin	ug/kg	ND	3.3	04/16/18 21:16	
Endosulfan I	ug/kg	ND	1.7	04/16/18 21:16	
Endosulfan II	ug/kg	ND	3.3	04/16/18 21:16	
Endosulfan sulfate	ug/kg	ND	3.3	04/16/18 21:16	
Endrin	ug/kg	ND	3.3	04/16/18 21:16	
Endrin aldehyde	ug/kg	ND	3.3	04/16/18 21:16	
Endrin ketone	ug/kg	ND	3.3	04/16/18 21:16	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/16/18 21:16	
gamma-Chlordane	ug/kg	ND	1.7	04/16/18 21:16	
Heptachlor	ug/kg	ND	1.7	04/16/18 21:16	
Heptachlor epoxide	ug/kg	ND	1.7	04/16/18 21:16	
Methoxychlor	ug/kg	ND	16.7	04/16/18 21:16	
Toxaphene	ug/kg	ND	50.0	04/16/18 21:16	
Decachlorobiphenyl (S)	%	96	30-150	04/16/18 21:16	
Tetrachloro-m-xylene (S)	%	98	30-150	04/16/18 21:16	

LABORATORY CONTROL SAMPLE: 2891844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.5	100	62-127	
4,4'-DDE	ug/kg	33.3	33.3	100	66-125	
4,4'-DDT	ug/kg	33.3	33.6	101	67-128	
Aldrin	ug/kg	16.7	15.1	91	66-125	
alpha-BHC	ug/kg	16.7	16.1	96	64-125	
alpha-Chlordane	ug/kg	16.7	15.5	93	68-125	
beta-BHC	ug/kg	16.7	15.4	93	69-125	
delta-BHC	ug/kg	16.7	13.0	78	42-133	
Dieldrin	ug/kg	33.3	34.2	103	69-126	
Endosulfan I	ug/kg	16.7	14.2	85	63-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2891844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	28.8	87	56-137	
Endrin	ug/kg	33.3	31.5	95	69-125	
Endrin aldehyde	ug/kg	33.3	31.4	94	65-125	
Endrin ketone	ug/kg	33.3	33.1	99	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.9	95	67-125	
gamma-Chlordane	ug/kg	16.7	14.0	84	63-125	
Heptachlor	ug/kg	16.7	16.2	97	69-125	
Heptachlor epoxide	ug/kg	16.7	15.5	93	68-125	
Methoxychlor	ug/kg	167	163	98	65-134	
Decachlorobiphenyl (S)	%			94	30-150	
Tetrachloro-m-xylene (S)	%			98	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891845 2891846

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427018001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	50.7	50.5	53.3	56.7	105	112	56-125	6	20	
4,4'-DDE	ug/kg	ND	50.7	50.5	56.1	55.9	111	110	32-150	0	20	
4,4'-DDT	ug/kg	ND	50.7	50.5	54.8	52.9	108	105	60-132	4	20	
Aldrin	ug/kg	ND	25.4	25.3	20J	21.5J	79	85	56-125		20	
alpha-BHC	ug/kg	ND	25.4	25.3	25.2J	24.3J	99	96	54-136		20	
alpha-Chlordane	ug/kg	ND	25.4	25.3	25.7	28.8	101	114	54-133	12	20	
beta-BHC	ug/kg	ND	25.4	25.3	26.7	26.6	105	105	30-150	0	20	
delta-BHC	ug/kg	ND	25.4	25.3	17.1J	18.7J	68	74	45-145		20	
Dieldrin	ug/kg	ND	50.7	50.5	63.9	54.7	126	108	47-150	15	20	
Endosulfan I	ug/kg	ND	25.4	25.3	24.1J	24.4J	95	97	35-145		20	
Endosulfan II	ug/kg	ND	50.7	50.5	46.4J	49.1J	92	97	50-147		20	
Endosulfan sulfate	ug/kg	ND	50.7	50.5	39.2J	44J	77	87	54-132		20	
Endrin	ug/kg	ND	50.7	50.5	41.8J	44.2J	82	87	62-125		20	
Endrin aldehyde	ug/kg	ND	50.7	50.5	45.3J	48.8J	89	97	33-150		20	
Endrin ketone	ug/kg	ND	50.7	50.5	45.9J	49.7J	91	98	56-144		20	
gamma-BHC (Lindane)	ug/kg	ND	25.4	25.3	23.7J	25.1J	94	99	63-125		20	
gamma-Chlordane	ug/kg	ND	25.4	25.3	21.9J	23.2J	86	92	45-132		20	
Heptachlor	ug/kg	ND	25.4	25.3	21.1J	23.1J	83	91	51-142		20	
Heptachlor epoxide	ug/kg	ND	25.4	25.3	14.1J	25.5	56	101	50-142		20	
Methoxychlor	ug/kg	ND	254	253	278	283	109	112	58-139	2	20	
Decachlorobiphenyl (S)	%						0	0	30-150			S4
Tetrachloro-m-xylene (S)	%						0	0	30-150			4M, D3, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532316 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890749 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/16/18 15:30	
Decachlorobiphenyl (S)	%	90	30-134	04/16/18 15:30	
Tetrachloro-m-xylene (S)	%	89	48-125	04/16/18 15:30	

LABORATORY CONTROL SAMPLE: 2890750

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	578	87	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	588	88	62-125	
Decachlorobiphenyl (S)	%			97	30-134	
Tetrachloro-m-xylene (S)	%			97	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890820 2890821

Parameter	Units	10427018004 Result	MSD		MS		MSD		% Rec Limits	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec		RPD	RPD	
PCB-1016 (Aroclor 1016)	ug/kg	ND	779	782	625	654	80	84	30-150	5	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	779	782	650	643	83	82	30-138	1	30	
Decachlorobiphenyl (S)	%						80	76	30-134			
Tetrachloro-m-xylene (S)	%						80	80	48-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532275 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
 Associated Lab Samples: 10427018001, 10427018002, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2890574 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,2-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/18/18 16:57	
1,3-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,4-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1-Methylnaphthalene	ug/kg	ND	330	04/18/18 16:57	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dimethylphenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dinitrophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dinitrotoluene	ug/kg	ND	330	04/18/18 16:57	
2,6-Dinitrotoluene	ug/kg	ND	330	04/18/18 16:57	
2-Chloronaphthalene	ug/kg	ND	330	04/18/18 16:57	
2-Chlorophenol	ug/kg	ND	330	04/18/18 16:57	
2-Methylnaphthalene	ug/kg	ND	330	04/18/18 16:57	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/18/18 16:57	
2-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
2-Nitrophenol	ug/kg	ND	330	04/18/18 16:57	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/18/18 16:57	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/18/18 16:57	
3-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/18/18 16:57	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/18/18 16:57	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/18/18 16:57	
4-Chloroaniline	ug/kg	ND	330	04/18/18 16:57	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/18/18 16:57	
4-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
4-Nitrophenol	ug/kg	ND	330	04/18/18 16:57	
Acenaphthene	ug/kg	ND	330	04/18/18 16:57	
Acenaphthylene	ug/kg	ND	330	04/18/18 16:57	
Anthracene	ug/kg	ND	330	04/18/18 16:57	
Benzo(a)anthracene	ug/kg	ND	330	04/18/18 16:57	
Benzo(a)pyrene	ug/kg	ND	330	04/18/18 16:57	
Benzo(b)fluoranthene	ug/kg	ND	330	04/18/18 16:57	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/18/18 16:57	
Benzo(k)fluoranthene	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/18/18 16:57	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/18/18 16:57	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

METHOD BLANK: 2890574

Matrix: Solid

Associated Lab Samples: 10427018001, 10427018002, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/18/18 16:57	
Carbazole	ug/kg	ND	330	04/18/18 16:57	
Chrysene	ug/kg	ND	330	04/18/18 16:57	
Di-n-butylphthalate	ug/kg	ND	330	04/18/18 16:57	
Di-n-octylphthalate	ug/kg	ND	330	04/18/18 16:57	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/18/18 16:57	
Dibenzofuran	ug/kg	ND	330	04/18/18 16:57	
Diethylphthalate	ug/kg	ND	330	04/18/18 16:57	
Dimethylphthalate	ug/kg	ND	330	04/18/18 16:57	
Fluoranthene	ug/kg	ND	330	04/18/18 16:57	
Fluorene	ug/kg	ND	330	04/18/18 16:57	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/18/18 16:57	
Hexachlorobenzene	ug/kg	ND	330	04/18/18 16:57	
Hexachloroethane	ug/kg	ND	330	04/18/18 16:57	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/18/18 16:57	
Isophorone	ug/kg	ND	330	04/18/18 16:57	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/18/18 16:57	
N-Nitrosodimethylamine	ug/kg	ND	330	04/18/18 16:57	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/18/18 16:57	
Naphthalene	ug/kg	ND	330	04/18/18 16:57	
Nitrobenzene	ug/kg	ND	330	04/18/18 16:57	
Pentachlorophenol	ug/kg	ND	670	04/18/18 16:57	
Phenanthrene	ug/kg	ND	330	04/18/18 16:57	
Phenol	ug/kg	ND	330	04/18/18 16:57	
Pyrene	ug/kg	ND	330	04/18/18 16:57	
2,4,6-Tribromophenol (S)	%	77	60-125	04/18/18 16:57	
2-Fluorobiphenyl (S)	%	79	30-132	04/18/18 16:57	
2-Fluorophenol (S)	%	72	40-125	04/18/18 16:57	
Nitrobenzene-d5 (S)	%	71	43-125	04/18/18 16:57	
p-Terphenyl-d14 (S)	%	86	62-125	04/18/18 16:57	
Phenol-d6 (S)	%	72	48-125	04/18/18 16:57	

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	983	59	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1010	61	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1320	79	63-125	
1,3-Dichlorobenzene	ug/kg	1670	980	59	38-125	
1,4-Dichlorobenzene	ug/kg	1670	984	59	39-125	
1-Methylnaphthalene	ug/kg	1670	1190	72	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1340	81	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1340	80	61-125	
2,4-Dichlorophenol	ug/kg	1670	1230	74	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1140	69	51-125	
2,4-Dinitrophenol	ug/kg	1670	1290	78	30-132	6M
2,4-Dinitrotoluene	ug/kg	1670	1580	95	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1490	89	63-125	
2-Chloronaphthalene	ug/kg	1670	1310	79	61-125	
2-Chlorophenol	ug/kg	1670	987	59	46-125	
2-Methylnaphthalene	ug/kg	1670	1160	70	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1070	64	50-125	
2-Nitroaniline	ug/kg	1670	1330	80	61-125	
2-Nitrophenol	ug/kg	1670	1110	66	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1150	69	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1260	75	47-125	
3-Nitroaniline	ug/kg	1670	1270	76	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1540J	93	30-141	6M
4-Bromophenylphenyl ether	ug/kg	1670	1380	83	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1360	82	64-125	
4-Chloroaniline	ug/kg	1670	853	51	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1390	83	64-125	
4-Nitroaniline	ug/kg	1670	1290	77	59-125	
4-Nitrophenol	ug/kg	1670	1300	78	54-125	
Acenaphthene	ug/kg	1670	1320	79	62-125	
Acenaphthylene	ug/kg	1670	1320	79	61-125	
Anthracene	ug/kg	1670	1360	81	66-125	
Benzo(a)anthracene	ug/kg	1670	1410	84	69-125	
Benzo(a)pyrene	ug/kg	1670	1410	85	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1410	85	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1470	88	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1440	87	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1070	64	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	914	55	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	773	46	37-125	6M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1530	92	69-131	
Butylbenzylphthalate	ug/kg	1670	1500	90	69-129	
Carbazole	ug/kg	1670	1430	86	66-125	
Chrysene	ug/kg	1670	1430	86	68-125	
Di-n-butylphthalate	ug/kg	1670	1510	90	69-125	
Di-n-octylphthalate	ug/kg	1670	1580	95	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1510	91	64-125	
Dibenzofuran	ug/kg	1670	1410	84	65-125	
Diethylphthalate	ug/kg	1670	1450	87	67-125	
Dimethylphthalate	ug/kg	1670	1440	86	67-125	
Fluoranthene	ug/kg	1670	1430	86	66-125	
Fluorene	ug/kg	1670	1390	83	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	951	57	40-125	
Hexachlorobenzene	ug/kg	1670	1400	84	62-125	
Hexachloroethane	ug/kg	1670	939	56	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1490	90	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1170	70	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1090	65	50-125	
N-Nitrosodimethylamine	ug/kg	1670	956	57	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1390	84	65-125	
Naphthalene	ug/kg	1670	1040	62	48-125	
Nitrobenzene	ug/kg	1670	984	59	48-125	
Pentachlorophenol	ug/kg	1670	1300	78	41-125	
Phenanthrene	ug/kg	1670	1350	81	66-125	
Phenol	ug/kg	1670	1000	60	46-125	
Pyrene	ug/kg	1670	1420	85	69-125	
2,4,6-Tribromophenol (S)	%			84	60-125	
2-Fluorobiphenyl (S)	%			69	30-132	
2-Fluorophenol (S)	%			52	40-125	
Nitrobenzene-d5 (S)	%			53	43-125	
p-Terphenyl-d14 (S)	%			85	62-125	
Phenol-d6 (S)	%			57	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890607 2890608

Parameter	Units	10427018008		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,2,4-Trichlorobenzene	ug/kg	ND	1940	1950	1400J	1390J	73	71	30-127		30		
1,2-Dichlorobenzene	ug/kg	ND	1940	1950	1330J	1150J	69	59	30-125		30		
1,2-Diphenylhydrazine	ug/kg	ND	1940	1950	1410J	1360J	73	70	30-150		30		
1,3-Dichlorobenzene	ug/kg	ND	1940	1950	1270J	1060J	66	54	30-125		30		
1,4-Dichlorobenzene	ug/kg	ND	1940	1950	1280J	1100J	66	57	30-125		30		
1-Methylnaphthalene	ug/kg	ND	1940	1950	1560J	1520J	79	76	42-125		30		
2,4,5-Trichlorophenol	ug/kg	ND	1940	1950	1400J	1400J	73	72	30-150		30		
2,4,6-Trichlorophenol	ug/kg	ND	1940	1950	1450J	1420J	75	73	30-150		30		
2,4-Dichlorophenol	ug/kg	ND	1940	1950	1490J	1420J	77	73	30-135		30		
2,4-Dimethylphenol	ug/kg	ND	1940	1950	1540J	1470J	79	76	30-148		30		
2,4-Dinitrophenol	ug/kg	ND	1940	1950	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	1940	1950	1030J	818J	53	42	30-150		30		
2,6-Dinitrotoluene	ug/kg	ND	1940	1950	1150J	1010J	60	52	30-150		30		
2-Chloronaphthalene	ug/kg	ND	1940	1950	1460J	1430J	76	74	30-138		30		
2-Chlorophenol	ug/kg	ND	1940	1950	1480J	1380J	76	71	30-130		30		
2-Methylnaphthalene	ug/kg	ND	1940	1950	1570J	1510J	79	76	46-125		30		
2-Methylphenol(o-Cresol)	ug/kg	ND	1940	1950	1440J	1440J	75	74	30-133		30		
2-Nitroaniline	ug/kg	ND	1940	1950	1610J	1580J	83	81	30-150		30		
2-Nitrophenol	ug/kg	ND	1940	1950	813J	ND	42	31	30-134		30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1940	1950	1460J	1380J	75	71	30-138		30		
3,3'-Dichlorobenzidine	ug/kg	ND	1940	1950	ND	ND	32	41	30-149		30		
3-Nitroaniline	ug/kg	ND	1940	1950	1780J	1750J	92	90	30-150		30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	1940	1950	ND	ND	0	0	30-133		30	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890607			2890608								
Parameter	Units	10427018008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec Limits	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec			
4-Bromophenylphenyl ether	ug/kg	ND	1940	1950	1520J	1460J	79	75	44-125	30	
4-Chloro-3-methylphenol	ug/kg	ND	1940	1950	1490J	1440J	77	74	30-150	30	
4-Chloroaniline	ug/kg	ND	1940	1950	ND	ND	49	46	30-125	30	
4-Chlorophenylphenyl ether	ug/kg	ND	1940	1950	1530J	1440J	79	74	44-125	30	
4-Nitroaniline	ug/kg	ND	1940	1950	1670J	1750J	86	90	30-150	30	
4-Nitrophenol	ug/kg	ND	1940	1950	ND	1280J	47	66	30-150	30	
Acenaphthene	ug/kg	ND	1940	1950	1540J	1790J	80	92	40-125	30	
Acenaphthylene	ug/kg	ND	1940	1950	1560J	1460J	81	75	30-150	30	
Anthracene	ug/kg	ND	1940	1950	1650J	2080J	77	99	30-150	30	
Benzo(a)anthracene	ug/kg	ND	1940	1950	1910J	3050J	78	136	30-150	30	
Benzo(a)pyrene	ug/kg	ND	1940	1950	1810J	2600J	94	134	30-150	30	
Benzo(b)fluoranthene	ug/kg	ND	1940	1950	1910J	2960J	99	152	30-150	30	M1
Benzo(g,h,i)perylene	ug/kg	ND	1940	1950	1930J	2310J	99	119	30-150	30	
Benzo(k)fluoranthene	ug/kg	ND	1940	1950	1630J	2200J	84	113	30-150	30	
bis(2-Chloroethoxy)methane	ug/kg	ND	1940	1950	1420J	1370J	73	70	30-134	30	
bis(2-Chloroethyl) ether	ug/kg	ND	1940	1950	1210J	1180J	62	61	30-125	30	
bis(2-Chloroisopropyl) ether	ug/kg	ND	1940	1950	1150J	1050J	59	54	30-125	30	6M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1940	1950	3800J	2960J	76	33	30-150	30	
Butylbenzylphthalate	ug/kg	ND	1940	1950	1790J	1760J	93	91	30-150	30	
Carbazole	ug/kg	ND	1940	1950	1650J	1960J	82	98	41-125	30	
Chrysene	ug/kg	ND	1940	1950	2000J	3120J	82	139	30-150	30	
Di-n-butylphthalate	ug/kg	ND	1940	1950	2730J	1930J	141	99	30-150	30	
Di-n-octylphthalate	ug/kg	ND	1940	1950	1870J	1770J	96	91	30-150	30	
Dibenz(a,h)anthracene	ug/kg	ND	1940	1950	1570J	1660J	81	85	30-150	30	
Dibenzofuran	ug/kg	ND	1940	1950	1620J	1590J	84	82	45-125	30	
Diethylphthalate	ug/kg	ND	1940	1950	1530J	1530J	79	79	30-150	30	
Dimethylphthalate	ug/kg	ND	1940	1950	1600J	1500J	82	77	30-150	30	
Fluoranthene	ug/kg	ND	1940	1950	2260J	5090	76	221	30-150	30	M1
Fluorene	ug/kg	ND	1940	1950	1660J	1740J	77	81	30-150	30	
Hexachloro-1,3-butadiene	ug/kg	ND	1940	1950	1420J	1230J	73	63	30-128	30	
Hexachlorobenzene	ug/kg	ND	1940	1950	1570J	1500J	81	77	30-150	30	
Hexachloroethane	ug/kg	ND	1940	1950	ND	ND	41	26	30-125	30	M1
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1940	1950	1690J	2080J	88	107	30-150	30	
Isophorone	ug/kg	ND	1940	1950	1440J	1380J	74	71	30-140	30	
N-Nitroso-di-n-propylamine	ug/kg	ND	1940	1950	1410J	1300J	73	67	30-147	30	
N-Nitrosodimethylamine	ug/kg	ND	1940	1950	ND	ND	52	45	30-125	30	
N-Nitrosodiphenylamine	ug/kg	ND	1940	1950	1760J	1700J	91	87	30-150	30	
Naphthalene	ug/kg	ND	1940	1950	1470J	1460J	76	75	44-125	30	
Nitrobenzene	ug/kg	ND	1940	1950	1290J	1270J	67	65	30-136	30	
Pentachlorophenol	ug/kg	ND	1940	1950	ND	ND	56	48	30-150	30	
Phenanthrene	ug/kg	ND	1940	1950	2210J	4090	53	150	30-150	30	
Phenol	ug/kg	ND	1940	1950	1380J	1340J	71	69	30-129	30	
Pyrene	ug/kg	ND	1940	1950	2560J	5020	76	203	30-150	30	M1
2,4,6-Tribromophenol (S)	%						64	68	60-125		
2-Fluorobiphenyl (S)	%						61	64	30-132		
2-Fluorophenol (S)	%						54	56	40-125		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Parameter	Units	2890607		2890608		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Nitrobenzene-d5 (S)	%.	10427018008				50	52	43-125		P3
p-Terphenyl-d14 (S)	%.					79	78	62-125		
Phenol-d6 (S)	%.					59	57	48-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 533467

Analysis Method: EPA 8270D

QC Batch Method: EPA 3550

Analysis Description: 8270D Solid MSSV

Associated Lab Samples: 10427018003

METHOD BLANK: 2897876

Matrix: Solid

Associated Lab Samples: 10427018003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,2-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/24/18 14:01	
1,3-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,4-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1-Methylnaphthalene	ug/kg	ND	330	04/24/18 14:01	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dimethylphenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dinitrophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dinitrotoluene	ug/kg	ND	330	04/24/18 14:01	
2,6-Dinitrotoluene	ug/kg	ND	330	04/24/18 14:01	
2-Chloronaphthalene	ug/kg	ND	330	04/24/18 14:01	
2-Chlorophenol	ug/kg	ND	330	04/24/18 14:01	
2-Methylnaphthalene	ug/kg	ND	330	04/24/18 14:01	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/24/18 14:01	
2-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
2-Nitrophenol	ug/kg	ND	330	04/24/18 14:01	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/24/18 14:01	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/24/18 14:01	
3-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/24/18 14:01	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/24/18 14:01	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/24/18 14:01	
4-Chloroaniline	ug/kg	ND	330	04/24/18 14:01	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/24/18 14:01	
4-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
4-Nitrophenol	ug/kg	ND	330	04/24/18 14:01	
Acenaphthene	ug/kg	ND	330	04/24/18 14:01	
Acenaphthylene	ug/kg	ND	330	04/24/18 14:01	
Anthracene	ug/kg	ND	330	04/24/18 14:01	
Benzo(a)anthracene	ug/kg	ND	330	04/24/18 14:01	
Benzo(a)pyrene	ug/kg	ND	330	04/24/18 14:01	
Benzo(b)fluoranthene	ug/kg	ND	330	04/24/18 14:01	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/24/18 14:01	
Benzo(k)fluoranthene	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/24/18 14:01	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/24/18 14:01	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427018

METHOD BLANK: 2897876

Matrix: Solid

Associated Lab Samples: 10427018003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/24/18 14:01	
Carbazole	ug/kg	ND	330	04/24/18 14:01	
Chrysene	ug/kg	ND	330	04/24/18 14:01	
Di-n-butylphthalate	ug/kg	ND	330	04/24/18 14:01	
Di-n-octylphthalate	ug/kg	ND	330	04/24/18 14:01	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/24/18 14:01	
Dibenzofuran	ug/kg	ND	330	04/24/18 14:01	
Diethylphthalate	ug/kg	ND	330	04/24/18 14:01	
Dimethylphthalate	ug/kg	ND	330	04/24/18 14:01	
Fluoranthene	ug/kg	ND	330	04/24/18 14:01	
Fluorene	ug/kg	ND	330	04/24/18 14:01	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/24/18 14:01	
Hexachlorobenzene	ug/kg	ND	330	04/24/18 14:01	
Hexachloroethane	ug/kg	ND	330	04/24/18 14:01	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/24/18 14:01	
Isophorone	ug/kg	ND	330	04/24/18 14:01	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/24/18 14:01	
N-Nitrosodimethylamine	ug/kg	ND	330	04/24/18 14:01	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/24/18 14:01	
Naphthalene	ug/kg	ND	330	04/24/18 14:01	
Nitrobenzene	ug/kg	ND	330	04/24/18 14:01	
Pentachlorophenol	ug/kg	ND	670	04/24/18 14:01	
Phenanthrene	ug/kg	ND	330	04/24/18 14:01	
Phenol	ug/kg	ND	330	04/24/18 14:01	
Pyrene	ug/kg	ND	330	04/24/18 14:01	
2,4,6-Tribromophenol (S)	%	93	60-125	04/24/18 14:01	
2-Fluorobiphenyl (S)	%	90	30-132	04/24/18 14:01	
2-Fluorophenol (S)	%	85	40-125	04/24/18 14:01	
Nitrobenzene-d5 (S)	%	85	43-125	04/24/18 14:01	
p-Terphenyl-d14 (S)	%	108	62-125	04/24/18 14:01	
Phenol-d6 (S)	%	85	48-125	04/24/18 14:01	

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1270	76	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1260	75	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1430	86	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1220	73	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1230	74	39-125	
1-Methylnaphthalene	ug/kg	1670	1360	82	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1490	89	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1470	88	61-125	
2,4-Dichlorophenol	ug/kg	1670	1440	86	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1350	81	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1740	104	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1630	98	63-125	
2-Chloronaphthalene	ug/kg	1670	1430	86	61-125	
2-Chlorophenol	ug/kg	1670	1270	76	46-125	
2-Methylnaphthalene	ug/kg	1670	1340	81	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1290	77	50-125	
2-Nitroaniline	ug/kg	1670	1510	91	61-125	
2-Nitrophenol	ug/kg	1670	1350	81	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1360	81	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1450	87	47-125	
3-Nitroaniline	ug/kg	1670	1460	88	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1530J	92	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1520	91	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1560	93	64-125	
4-Chloroaniline	ug/kg	1670	1050	63	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1500	90	64-125	
4-Nitroaniline	ug/kg	1670	1510	91	59-125	
4-Nitrophenol	ug/kg	1670	1430	86	54-125	
Acenaphthene	ug/kg	1670	1440	87	62-125	
Acenaphthylene	ug/kg	1670	1450	87	61-125	
Anthracene	ug/kg	1670	1490	89	66-125	
Benzo(a)anthracene	ug/kg	1670	1580	95	69-125	
Benzo(a)pyrene	ug/kg	1670	1560	94	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1540	92	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1650	99	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1590	96	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1310	79	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1200	72	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1030	62	37-125 6M	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1800	108	69-131	
Butylbenzylphthalate	ug/kg	1670	1740	104	69-129	
Carbazole	ug/kg	1670	1580	95	66-125	
Chrysene	ug/kg	1670	1580	95	68-125	
Di-n-butylphthalate	ug/kg	1670	1700	102	69-125	
Di-n-octylphthalate	ug/kg	1670	1830	110	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1680	101	64-125	
Dibenzofuran	ug/kg	1670	1500	90	65-125	
Diethylphthalate	ug/kg	1670	1600	96	67-125	
Dimethylphthalate	ug/kg	1670	1590	95	67-125	
Fluoranthene	ug/kg	1670	1560	94	66-125	
Fluorene	ug/kg	1670	1490	89	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1210	72	40-125	
Hexachlorobenzene	ug/kg	1670	1550	93	62-125	
Hexachloroethane	ug/kg	1670	1230	74	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1650	99	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1350	81	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1260	75	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1170	70	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1570	94	65-125	
Naphthalene	ug/kg	1670	1270	76	48-125	
Nitrobenzene	ug/kg	1670	1250	75	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1490	89	66-125	
Phenol	ug/kg	1670	1250	75	46-125	
Pyrene	ug/kg	1670	1600	96	69-125	
2,4,6-Tribromophenol (S)	%			97	60-125	
2-Fluorobiphenyl (S)	%			81	30-132	
2-Fluorophenol (S)	%			74	40-125	
Nitrobenzene-d5 (S)	%			72	43-125	
p-Terphenyl-d14 (S)	%			99	62-125	
Phenol-d6 (S)	%			74	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878 2897879

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427906003 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	<70.8	1850	1840	1210	1310	66	71	30-127	8	30	
1,2-Dichlorobenzene	ug/kg	<68.9	1850	1840	1250	1250	68	68	30-125	0	30	
1,2-Diphenylhydrazine	ug/kg	<66.0	1850	1840	1010	1080	55	59	30-150	7	30	
1,3-Dichlorobenzene	ug/kg	<68.1	1850	1840	1220	1220	66	66	30-125	0	30	
1,4-Dichlorobenzene	ug/kg	<66.5	1850	1840	1230	1210	67	66	30-125	2	30	
1-Methylnaphthalene	ug/kg	<57.3	1850	1840	1270	1360	69	74	42-125	7	30	
2,4,5-Trichlorophenol	ug/kg	<71.3	1850	1840	1160	1250	63	68	30-150	8	30	
2,4,6-Trichlorophenol	ug/kg	<51.8	1850	1840	1240	1360	67	74	30-150	9	30	
2,4-Dichlorophenol	ug/kg	<68.8	1850	1840	1290	1390	70	75	30-135	8	30	
2,4-Dimethylphenol	ug/kg	<137	1850	1840	1290	1430	70	78	30-148	10	30	
2,4-Dinitrophenol	ug/kg	<82.1	1850	1840	ND	ND	0	0	30-125		30	M1
2,4-Dinitrotoluene	ug/kg	<49.4	1850	1840	555	642	30	35	30-150	14	30	
2,6-Dinitrotoluene	ug/kg	<50.9	1850	1840	710	771	39	42	30-150	8	30	
2-Chloronaphthalene	ug/kg	<51.8	1850	1840	1250	1330	68	72	30-138	6	30	
2-Chlorophenol	ug/kg	<72.6	1850	1840	1320	1350	72	74	30-130	2	30	
2-Methylnaphthalene	ug/kg	<56.6	1850	1840	1260	1350	68	73	46-125	7	30	
2-Methylphenol(o-Cresol)	ug/kg	<91.9	1850	1840	1310	1370	71	74	30-133	4	30	
2-Nitroaniline	ug/kg	<80.6	1850	1840	1610	1730	87	94	30-150	7	30	
2-Nitrophenol	ug/kg	<68.7	1850	1840	562	610	30	33	30-134	8	30	
3&4-Methylphenol(m&p Cresol)	ug/kg	<82.3	1850	1840	1330	1390	72	75	30-138	5	30	
3,3'-Dichlorobenzidine	ug/kg	<87.3	1850	1840	1460	1420	79	77	30-149	2	30	
3-Nitroaniline	ug/kg	<89.4	1850	1840	1860	1890	101	102	30-150	1	30	
4,6-Dinitro-2-methylphenol	ug/kg	<147	1850	1840	ND	ND	0	0	30-133		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878												2897879											
Parameter	Units	MS		MSD		MS		MSD		% Rec		Max		Qual									
		10427906003	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD												
4-Bromophenylphenyl ether	ug/kg	<61.5	1850	1840	1260	1390	68	76	44-125	10	30												
4-Chloro-3-methylphenol	ug/kg	<50.6	1850	1840	1280	1420	70	77	30-150	10	30												
4-Chloroaniline	ug/kg	<102	1850	1840	1060	953	57	52	30-125	11	30												
4-Chlorophenylphenyl ether	ug/kg	<49.9	1850	1840	1280	1360	69	74	44-125	6	30												
4-Nitroaniline	ug/kg	<65.1	1850	1840	1800	1850	97	100	30-150	3	30												
4-Nitrophenol	ug/kg	<105	1850	1840	1100	1160	60	63	30-150	6	30												
Acenaphthene	ug/kg	<59.8	1850	1840	1150	1250	63	68	40-125	8	30												
Acenaphthylene	ug/kg	<50.0	1850	1840	1220	1320	66	72	30-150	8	30												
Anthracene	ug/kg	<52.6	1850	1840	1220	1340	66	73	30-150	9	30												
Benzo(a)anthracene	ug/kg	<42.4	1850	1840	1220	1340	66	73	30-150	10	30												
Benzo(a)pyrene	ug/kg	<41.3	1850	1840	1120	1270	61	69	30-150	13	30												
Benzo(b)fluoranthene	ug/kg	<44.2	1850	1840	1200	1290	65	70	30-150	7	30												
Benzo(g,h,i)perylene	ug/kg	<31.6	1850	1840	967	1090	53	59	30-150	12	30												
Benzo(k)fluoranthene	ug/kg	<44.2	1850	1840	1160	1300	63	71	30-150	12	30												
bis(2-Chloroethoxy)methane	ug/kg	<70.8	1850	1840	1300	1370	71	74	30-134	5	30												
bis(2-Chloroethyl) ether	ug/kg	<80.0	1850	1840	1200	1280	65	70	30-125	7	30												
bis(2-Chloroisopropyl) ether	ug/kg	<84.7	1850	1840	1050	1060	57	57	30-125	1	30	6M											
bis(2-Ethylhexyl)phthalate	ug/kg	104J	1850	1840	1490	1660	75	84	30-150	11	30												
Butylbenzylphthalate	ug/kg	140J	1850	1840	1560	1660	77	83	30-150	7	30												
Carbazole	ug/kg	<49.1	1850	1840	1360	1450	74	79	41-125	7	30												
Chrysene	ug/kg	<36.7	1850	1840	1210	1350	66	73	30-150	11	30												
Di-n-butylphthalate	ug/kg	<49.9	1850	1840	1430	1550	78	84	30-150	8	30												
Di-n-octylphthalate	ug/kg	<112	1850	1840	1450	1570	79	85	30-150	7	30												
Dibenz(a,h)anthracene	ug/kg	<37.7	1850	1840	1150	1260	63	69	30-150	9	30												
Dibenzofuran	ug/kg	<53.0	1850	1840	1270	1370	69	74	45-125	7	30												
Diethylphthalate	ug/kg	<43.3	1850	1840	1380	1480	75	81	30-150	7	30												
Dimethylphthalate	ug/kg	<56.2	1850	1840	1400	1470	76	80	30-150	5	30												
Fluoranthene	ug/kg	<39.0	1850	1840	1210	1340	65	72	30-150	10	30												
Fluorene	ug/kg	<50.9	1850	1840	1260	1340	68	73	30-150	6	30												
Hexachloro-1,3-butadiene	ug/kg	<84.2	1850	1840	1150	1270	62	69	30-128	9	30												
Hexachlorobenzene	ug/kg	<47.2	1850	1840	1060	1220	58	66	30-150	14	30												
Hexachloroethane	ug/kg	<74.7	1850	1840	303J	252J	16	14	30-125		30	M1											
Indeno(1,2,3-cd)pyrene	ug/kg	<42.5	1850	1840	1070	1180	58	64	30-150	9	30												
Isophorone	ug/kg	<83.7	1850	1840	1230	1350	67	73	30-140	9	30												
N-Nitroso-di-n-propylamine	ug/kg	<112	1850	1840	1300	1290	70	70	30-147	0	30												
N-Nitrosodimethylamine	ug/kg	<95.6	1850	1840	1240	1190	67	65	30-125	4	30												
N-Nitrosodiphenylamine	ug/kg	<44.9	1850	1840	1360	1470	74	80	30-150	8	30												
Naphthalene	ug/kg	<69.5	1850	1840	1240	1320	67	72	44-125	6	30												
Nitrobenzene	ug/kg	<73.4	1850	1840	1180	1230	64	67	30-136	4	30												
Pentachlorophenol	ug/kg	<108	1850	1840	528J	591J	29	32	30-150		30	M1											
Phenanthrene	ug/kg	<50.0	1850	1840	1240	1330	66	71	30-150	8	30												
Phenol	ug/kg	<70.6	1850	1840	1250	1290	68	70	30-129	3	30												
Pyrene	ug/kg	<38.4	1850	1840	1270	1400	67	74	30-150	10	30												
2,4,6-Tribromophenol (S)	%						62	67	60-125														
2-Fluorobiphenyl (S)	%						67	71	30-132														
2-Fluorophenol (S)	%						68	69	40-125														

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Parameter	Units	10427906003		2897878		2897879		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result							
Nitrobenzene-d5 (S)	%.							61	65		43-125			
p-Terphenyl-d14 (S)	%.							72	78		62-125			
Phenol-d6 (S)	%.							66	70		48-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532017 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2889031 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/16/18 10:37	
Acenaphthylene	ug/kg	ND	10.0	04/16/18 10:37	
Anthracene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(a)anthracene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(a)pyrene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/16/18 10:37	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/16/18 10:37	
Chrysene	ug/kg	ND	10.0	04/16/18 10:37	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/16/18 10:37	
Fluoranthene	ug/kg	ND	10.0	04/16/18 10:37	
Fluorene	ug/kg	ND	10.0	04/16/18 10:37	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/16/18 10:37	
Naphthalene	ug/kg	ND	10.0	04/16/18 10:37	
Phenanthrene	ug/kg	ND	10.0	04/16/18 10:37	
Pyrene	ug/kg	ND	10.0	04/16/18 10:37	
2-Fluorobiphenyl (S)	%	67	42-125	04/16/18 10:37	
p-Terphenyl-d14 (S)	%	94	57-125	04/16/18 10:37	

LABORATORY CONTROL SAMPLE: 2889032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	23.8	71	52-125	
Acenaphthylene	ug/kg	33.3	25.1	75	50-125	
Anthracene	ug/kg	33.3	27.1	81	65-125	
Benzo(a)anthracene	ug/kg	33.3	29.8	89	60-125	
Benzo(a)pyrene	ug/kg	33.3	28.7	86	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	30.9	93	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	30.3	91	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.7	89	67-125	
Chrysene	ug/kg	33.3	29.9	90	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	34.4	103	63-125	
Fluoranthene	ug/kg	33.3	30.4	91	75-125	
Fluorene	ug/kg	33.3	24.9	75	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	32.9	99	63-125	
Naphthalene	ug/kg	33.3	24.4	73	49-125	
Phenanthrene	ug/kg	33.3	26.9	81	65-125	
Pyrene	ug/kg	33.3	29.9	90	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

LABORATORY CONTROL SAMPLE: 2889032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Fluorobiphenyl (S)	%.			78	42-125	
p-Terphenyl-d14 (S)	%.			95	57-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2889033 2889034

Parameter	Units	10427017002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Acenaphthene	ug/kg	ND	35.4	35.2	27.4	30.9	78	88	30-125	12	30	
Acenaphthylene	ug/kg	0.018 mg/kg	35.4	35.2	36.3	35.7	51	49	30-133	2	30	
Anthracene	ug/kg	0.030 mg/kg	35.4	35.2	49.3	44.1	55	40	30-150	11	30	
Benzo(a)anthracene	ug/kg	0.11 mg/kg	35.4	35.2	107	91.4	-14	-59	30-150	16	30	M1
Benzo(a)pyrene	ug/kg	0.11 mg/kg	35.4	35.2	108	94.6	-6	-44	30-150	13	30	M1
Benzo(b)fluoranthene	ug/kg	0.14 mg/kg	35.4	35.2	140	107	-8	-101	30-150	27	30	M1
Benzo(g,h,i)perylene	ug/kg	0.059 mg/kg	35.4	35.2	69.7	66.6	31	22	30-150	5	30	M1
Benzo(k)fluoranthene	ug/kg	0.052 mg/kg	35.4	35.2	61.5	68.2	27	46	30-150	10	30	M1
Chrysene	ug/kg	0.12 mg/kg	35.4	35.2	98.6	90.3	-60	-84	30-150	9	30	M1
Dibenz(a,h)anthracene	ug/kg	0.020 mg/kg	35.4	35.2	43.0	35.6	64	43	30-131	19	30	
Fluoranthene	ug/kg	0.20 mg/kg	35.4	35.2	167	135	-85	-174	30-150	21	30	M1
Fluorene	ug/kg	ND	35.4	35.2	30.5	32.5	86	92	30-147	6	30	
Indeno(1,2,3-cd)pyrene	ug/kg	0.058 mg/kg	35.4	35.2	68.8	66.7	31	25	30-150	3	30	M1
Naphthalene	ug/kg	ND	35.4	35.2	20.8	20.3	59	57	30-131	3	30	
Phenanthrene	ug/kg	0.083 mg/kg	35.4	35.2	80.5	69.8	-6	-36	30-150	14	30	M1
Pyrene	ug/kg	0.18 mg/kg	35.4	35.2	157	129	-74	-155	30-150	20	30	M1
2-Fluorobiphenyl (S)	%.						73	78	42-125			
p-Terphenyl-d14 (S)	%.						104	97	57-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 531964 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006

METHOD BLANK: 2888898 Matrix: Solid

Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/13/18 12:00	
n-Triacontane (S)	%.	93	50-150	04/13/18 12:00	

LABORATORY CONTROL SAMPLE & LCSD: 2888899

2888900

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	71.9	76.6	90	96	70-120	6	20	
n-Triacontane (S)	%.				83	92	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 532104

Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO

Analysis Description: WIDRO GCS

Associated Lab Samples: 10427018007, 10427018008

METHOD BLANK: 2889696

Matrix: Solid

Associated Lab Samples: 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/16/18 10:58	
n-Triacontane (S)	%.	95	50-150	04/16/18 10:58	

LABORATORY CONTROL SAMPLE & LCSD: 2889697

2889698

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	82.3	69.9	103	87	70-120	16	20	
n-Triacontane (S)	%.				109	90	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 437577 Analysis Method: EPA 7196A
 QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

METHOD BLANK: 2021337 Matrix: Solid
 Associated Lab Samples: 10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/19/18 13:14	

LABORATORY CONTROL SAMPLE: 2021338

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1110	995	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021707 2021708

Parameter	Units	50194083001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	962	1040	866	884	90	85	75-125	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021709 2021710

Parameter	Units	50194083001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	38.9	40.3	25.7	34.4	66	85	75-125	29	20	M3,R1

SAMPLE DUPLICATE: 2021711

Parameter	Units	10427018007 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	D3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch:	286553	Analysis Method:	EPA 9012
QC Batch Method:	EPA 9012A	Analysis Description:	9012 Cyanide
Associated Lab Samples:	10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008		

METHOD BLANK:	1676305	Matrix:	Solid
Associated Lab Samples:	10427018001, 10427018002, 10427018003, 10427018004, 10427018005, 10427018006, 10427018007, 10427018008		

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/20/18 13:32	

LABORATORY CONTROL SAMPLE: 1676306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676307 1676308

Parameter	Units	40167646001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.089J	1.9	2	2.0	2.1	98	99	80-120	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676309 1676310

Parameter	Units	10427291004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.40	2.4	2.2	2.5	2.2	88	82	80-120	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

QC Batch: 140731 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10427018001, 10427018002

METHOD BLANK: 557012 Matrix: Solid
Associated Lab Samples: 10427018001, 10427018002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/17/18 21:06	

LABORATORY CONTROL SAMPLE: 557011

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	48.7	50.0	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557013 557014

Parameter	Units	10427018001		557013		557014		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Fluoride	mg/kg	1.7	48.5	48.9	19.9	18.7	37	35	80-120	7	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557015 557016

Parameter	Units	10427159001		557015		557016		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Fluoride	mg/kg	ND	48.8	47.6	23.2	26.5	48	56	80-120	13	20 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 140842

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10427018006, 10427018008

METHOD BLANK: 557419

Matrix: Solid

Associated Lab Samples: 10427018006, 10427018008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/19/18 16:14	

LABORATORY CONTROL SAMPLE: 557418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	52.6	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557420 557421

Parameter	Units	10427291004 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Fluoride	mg/kg	1.4	49.8	49.8	12.1	12.9	21	23	80-120	7	20	M1		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557422 557423

Parameter	Units	10427291008 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Fluoride	mg/kg	ND	49.7	49	35.4	35.5	69	71	80-120	0	20	M1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

QC Batch: 140846

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10427018003, 10427018004, 10427018005, 10427018007

METHOD BLANK: 557430

Matrix: Solid

Associated Lab Samples: 10427018003, 10427018004, 10427018005, 10427018007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/20/18 01:22	

LABORATORY CONTROL SAMPLE: 557429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	49.7	52.1	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557431 557432

Parameter	Units	557431		557432		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427018004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Fluoride	mg/kg	2.1	48.9	49.8	35.7	43.7	69	84	80-120	20	20 M1

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth
PASI-G Pace Analytical Services - Green Bay
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427018

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M Sample was black in color and slightly viscous.
2M Sample was black in color.
3M Sample was brown in color.
4M Sample was dark brown in color.
5M Sample was yellow in color.
6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
C0 Result confirmed by second analysis.
D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

ANALYTE QUALIFIERS

D4	Sample was diluted due to the presence of high levels of target analytes.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
MN	The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
T6	High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427018001	FD-TT-01 (10-12 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018002	FD-TT-02 (7-9 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018003	FD-SB-A1 (3-6 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018004	FD-SB-B1 (11-13 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018005	FD-SB-C1 (5-8 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018006	FD-TT-03 (2-5 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018007	FD-SB-D1 (11-16 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018008	FD-SB-E1 (10-15 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427018001	FD-TT-01 (10-12 WM)	EPA 3550	532491	EPA 8081B	532802
10427018002	FD-TT-02 (7-9 WM)	EPA 3550	532491	EPA 8081B	532802
10427018003	FD-SB-A1 (3-6 S)	EPA 3550	532491	EPA 8081B	532802
10427018004	FD-SB-B1 (11-13 WM)	EPA 3550	532491	EPA 8081B	532802
10427018005	FD-SB-C1 (5-8 WM)	EPA 3550	532491	EPA 8081B	532802
10427018006	FD-TT-03 (2-5 WM)	EPA 3550	532491	EPA 8081B	532802
10427018007	FD-SB-D1 (11-16 WM)	EPA 3550	532491	EPA 8081B	532802
10427018008	FD-SB-E1 (10-15 WM)	EPA 3550	532491	EPA 8081B	532802
10427018001	FD-TT-01 (10-12 WM)	EPA 3550	532316	EPA 8082A	532613
10427018002	FD-TT-02 (7-9 WM)	EPA 3550	532316	EPA 8082A	532613
10427018003	FD-SB-A1 (3-6 S)	EPA 3550	532316	EPA 8082A	532613
10427018004	FD-SB-B1 (11-13 WM)	EPA 3550	532316	EPA 8082A	532613
10427018005	FD-SB-C1 (5-8 WM)	EPA 3550	532316	EPA 8082A	532613
10427018006	FD-TT-03 (2-5 WM)	EPA 3550	532316	EPA 8082A	532613
10427018007	FD-SB-D1 (11-16 WM)	EPA 3550	532316	EPA 8082A	532613
10427018008	FD-SB-E1 (10-15 WM)	EPA 3550	532316	EPA 8082A	532613
10427018001	FD-TT-01 (10-12 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018002	FD-TT-02 (7-9 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018003	FD-SB-A1 (3-6 S)	WI MOD DRO	531964	WI MOD DRO	532306
10427018004	FD-SB-B1 (11-13 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018005	FD-SB-C1 (5-8 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018006	FD-TT-03 (2-5 WM)	WI MOD DRO	531964	WI MOD DRO	532306
10427018007	FD-SB-D1 (11-16 WM)	WI MOD DRO	532104	WI MOD DRO	532518
10427018008	FD-SB-E1 (10-15 WM)	WI MOD DRO	532104	WI MOD DRO	532518
10427018001	FD-TT-01 (10-12 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018002	FD-TT-02 (7-9 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018003	FD-SB-A1 (3-6 S)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018004	FD-SB-B1 (11-13 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018005	FD-SB-C1 (5-8 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018006	FD-TT-03 (2-5 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018007	FD-SB-D1 (11-16 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018008	FD-SB-E1 (10-15 WM)	EPA 5030 Medium Soil	533563	WI MOD GRO	533834
10427018001	FD-TT-01 (10-12 WM)	EPA 3050	532178	EPA 6010C	532248
10427018002	FD-TT-02 (7-9 WM)	EPA 3050	532178	EPA 6010C	532248
10427018003	FD-SB-A1 (3-6 S)	EPA 3050	532178	EPA 6010C	532248
10427018004	FD-SB-B1 (11-13 WM)	EPA 3050	532178	EPA 6010C	532248
10427018005	FD-SB-C1 (5-8 WM)	EPA 3050	532178	EPA 6010C	532248
10427018006	FD-TT-03 (2-5 WM)	EPA 3050	532178	EPA 6010C	532248

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427018

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427018007	FD-SB-D1 (11-16 WM)	EPA 3050	532178	EPA 6010C	532248
10427018008	FD-SB-E1 (10-15 WM)	EPA 3050	532178	EPA 6010C	532248
10427018001	FD-TT-01 (10-12 WM)	EPA 3050B	437311	EPA 6020	437864
10427018002	FD-TT-02 (7-9 WM)	EPA 3050B	437311	EPA 6020	437864
10427018003	FD-SB-A1 (3-6 S)	EPA 3050B	437311	EPA 6020	437864
10427018004	FD-SB-B1 (11-13 WM)	EPA 3050B	437311	EPA 6020	437864
10427018005	FD-SB-C1 (5-8 WM)	EPA 3050B	437311	EPA 6020	437864
10427018006	FD-TT-03 (2-5 WM)	EPA 3050B	437311	EPA 6020	437864
10427018007	FD-SB-D1 (11-16 WM)	EPA 3050B	437311	EPA 6020	437864
10427018008	FD-SB-E1 (10-15 WM)	EPA 3050B	437311	EPA 6020	437864
10427018001	FD-TT-01 (10-12 WM)	EPA 3050	532177	EPA 6020A	532245
10427018002	FD-TT-02 (7-9 WM)	EPA 3050	532177	EPA 6020A	532245
10427018003	FD-SB-A1 (3-6 S)	EPA 3050	532177	EPA 6020A	532245
10427018004	FD-SB-B1 (11-13 WM)	EPA 3050	532177	EPA 6020A	532245
10427018005	FD-SB-C1 (5-8 WM)	EPA 3050	532177	EPA 6020A	532245
10427018006	FD-TT-03 (2-5 WM)	EPA 3050	532177	EPA 6020A	532245
10427018007	FD-SB-D1 (11-16 WM)	EPA 3050	532177	EPA 6020A	532245
10427018008	FD-SB-E1 (10-15 WM)	EPA 3050	532177	EPA 6020A	532245
10427018001	FD-TT-01 (10-12 WM)	EPA 7471	532184	EPA 7471	532397
10427018002	FD-TT-02 (7-9 WM)	EPA 7471	532184	EPA 7471	532397
10427018003	FD-SB-A1 (3-6 S)	EPA 7471	532184	EPA 7471	532397
10427018004	FD-SB-B1 (11-13 WM)	EPA 7471	532184	EPA 7471	532397
10427018005	FD-SB-C1 (5-8 WM)	EPA 7471	532184	EPA 7471	532397
10427018006	FD-TT-03 (2-5 WM)	EPA 7471	532184	EPA 7471	532397
10427018007	FD-SB-D1 (11-16 WM)	EPA 7471	532184	EPA 7471	532397
10427018008	FD-SB-E1 (10-15 WM)	EPA 7471	532184	EPA 7471	532397
10427018001	FD-TT-01 (10-12 WM)	ASTM D2974	532990		
10427018002	FD-TT-02 (7-9 WM)	ASTM D2974	532990		
10427018003	FD-SB-A1 (3-6 S)	ASTM D2974	532990		
10427018004	FD-SB-B1 (11-13 WM)	ASTM D2974	532990		
10427018005	FD-SB-C1 (5-8 WM)	ASTM D2974	532990		
10427018006	FD-TT-03 (2-5 WM)	ASTM D2974	532990		
10427018007	FD-SB-D1 (11-16 WM)	ASTM D2974	532990		
10427018008	FD-SB-E1 (10-15 WM)	ASTM D2974	532990		
10427018001	FD-TT-01 (10-12 WM)	EPA 3550	532275	EPA 8270D	532657
10427018002	FD-TT-02 (7-9 WM)	EPA 3550	532275	EPA 8270D	532657
10427018003	FD-SB-A1 (3-6 S)	EPA 3550	533467	EPA 8270D	533832
10427018004	FD-SB-B1 (11-13 WM)	EPA 3550	532275	EPA 8270D	532657
10427018005	FD-SB-C1 (5-8 WM)	EPA 3550	532275	EPA 8270D	532657
10427018006	FD-TT-03 (2-5 WM)	EPA 3550	532275	EPA 8270D	532657
10427018007	FD-SB-D1 (11-16 WM)	EPA 3550	532275	EPA 8270D	532657
10427018008	FD-SB-E1 (10-15 WM)	EPA 3550	532275	EPA 8270D	532657
10427018001	FD-TT-01 (10-12 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018002	FD-TT-02 (7-9 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018003	FD-SB-A1 (3-6 S)	EPA 3550	532017	EPA 8270D by SIM	532494

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427018004	FD-SB-B1 (11-13 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018005	FD-SB-C1 (5-8 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018006	FD-TT-03 (2-5 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018007	FD-SB-D1 (11-16 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018008	FD-SB-E1 (10-15 WM)	EPA 3550	532017	EPA 8270D by SIM	532494
10427018001	FD-TT-01 (10-12 WM)	EPA 5035/5030B	533507	EPA 8260B	533754
10427018002	FD-TT-02 (7-9 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018003	FD-SB-A1 (3-6 S)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018004	FD-SB-B1 (11-13 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018005	FD-SB-C1 (5-8 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018006	FD-TT-03 (2-5 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018007	FD-SB-D1 (11-16 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018008	FD-SB-E1 (10-15 WM)	EPA 5035/5030B	533615	EPA 8260B	533771
10427018001	FD-TT-01 (10-12 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018002	FD-TT-02 (7-9 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018003	FD-SB-A1 (3-6 S)	EPA 3060A	437577	EPA 7196A	437974
10427018004	FD-SB-B1 (11-13 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018005	FD-SB-C1 (5-8 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018006	FD-TT-03 (2-5 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018007	FD-SB-D1 (11-16 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018008	FD-SB-E1 (10-15 WM)	EPA 3060A	437577	EPA 7196A	437974
10427018001	FD-TT-01 (10-12 WM)	Trivalent Chromium Calculation	439162		
10427018002	FD-TT-02 (7-9 WM)	Trivalent Chromium Calculation	439162		
10427018003	FD-SB-A1 (3-6 S)	Trivalent Chromium Calculation	439162		
10427018004	FD-SB-B1 (11-13 WM)	Trivalent Chromium Calculation	439162		
10427018005	FD-SB-C1 (5-8 WM)	Trivalent Chromium Calculation	439162		
10427018006	FD-TT-03 (2-5 WM)	Trivalent Chromium Calculation	439162		
10427018007	FD-SB-D1 (11-16 WM)	Trivalent Chromium Calculation	439162		
10427018008	FD-SB-E1 (10-15 WM)	Trivalent Chromium Calculation	439162		
10427018001	FD-TT-01 (10-12 WM)	EPA 9012A	286553	EPA 9012	286614
10427018002	FD-TT-02 (7-9 WM)	EPA 9012A	286553	EPA 9012	286614
10427018003	FD-SB-A1 (3-6 S)	EPA 9012A	286553	EPA 9012	286614
10427018004	FD-SB-B1 (11-13 WM)	EPA 9012A	286553	EPA 9012	286614
10427018005	FD-SB-C1 (5-8 WM)	EPA 9012A	286553	EPA 9012	286614
10427018006	FD-TT-03 (2-5 WM)	EPA 9012A	286553	EPA 9012	286614
10427018007	FD-SB-D1 (11-16 WM)	EPA 9012A	286553	EPA 9012	286614
10427018008	FD-SB-E1 (10-15 WM)	EPA 9012A	286553	EPA 9012	286614
10427018001	FD-TT-01 (10-12 WM)	EPA 300.0	140731	EPA 9056A	140736
10427018002	FD-TT-02 (7-9 WM)	EPA 300.0	140731	EPA 9056A	140736
10427018003	FD-SB-A1 (3-6 S)	EPA 300.0	140846	EPA 9056A	140854

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427018

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427018004	FD-SB-B1 (11-13 WM)	EPA 300.0	140846	EPA 9056A	140854
10427018005	FD-SB-C1 (5-8 WM)	EPA 300.0	140846	EPA 9056A	140854
10427018006	FD-TT-03 (2-5 WM)	EPA 300.0	140842	EPA 9056A	140851
10427018007	FD-SB-D1 (11-16 WM)	EPA 300.0	140846	EPA 9056A	140854
10427018008	FD-SB-E1 (10-15 WM)	EPA 300.0	140842	EPA 9056A	140851

REPORT OF LABORATORY ANALYSIS

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WO#: 10427018



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

COC

Turnaround Time:

CC

PROJECT/CLIENT INFO

LABORATORY

ONLY

Facility Code: MPCA - Freeway LF Solids Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA - Freeway LF Solids Project Task Code:

Address:

Project Manager:

18-00383
EPIC Profile #38716

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample-Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wt-Ground=Groundwater
 Wt-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

RESERV.

ANALYSIS

see attached for soil waste (-SD) 10X15

+Dioxins

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

Location Identifier	Sample Type	Date	Time	Start Depth, in	End Depth, in	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	RESERV.	Lab Sample No.	#
FD-SB-1	S	4/11/18				C	SD				13				1
FD-TF-01 (10-12 W/M)	S	4/11/18	10:20			C	SD				13	X	X		2 001
FD-TF-02 (9-9 W/M)	S	4/11/18	12:20			C	SD				13	X			3 002
FD-SB-01 (3-2 S)	S	4/11/18	13:00			C	SD				13	X	X		4 003
FD-SB-02	S	4/11/18				C	SD				13	X			5
FD-SB-03 (11-13 W/M)	S	4/11/18	13:50			C	SD				13	X			6 004
FD-SB-04 (5-5 W/M)	S	4/11/18	14:30			C	SD				13	X	X		7 005
FD-TF-03 (2-5 W/M)	S	4/11/18	14:50			C	SD				13	X			8 006
FD-SB-05 (11-16 W/M)	S	4/11/18	15:30			C	SD				13	X	X		9 007
FD-SB-06 (10-15 W/M)	S	4/11/18	16:10			C	SD				13	X			10 008

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) <u>David Anderson / Pace Analytical</u>	<u>4/11/18/16:50</u>	<u>Nate Ribman / Pace</u>	<u>4/11/18/16:50</u>
<u>Nate Ribman / Pace</u>	<u>4/11/18/17:13</u>	<u>[Signature] / Pace</u>	<u>4/11/18/17:13</u>

T=6.2

Sample Condition Upon Receipt

Client Name: MN Pollution Control Project #: **WO# : 10427018**

PM: JMA Due Date: 04/19/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.0 Cooler Temp Corrected (°C): 6.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: JMA 4/11/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SO</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION:

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: J. Anderson

Date: 04/12/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately
 half of the samples. To be determined in the field by MPCA staff.



Document Name:
Sample Condition Upon Receipt Form

Document Revised: 7Mar2018
Page 1 of 1

Document No.:
F-DUL-C-001-rev.05

Issuing Authority:
Pace Duluth Minnesota Quality Office

Sample Condition Upon Receipt

Client Name:

Project #:

WO# : 12107092

PM: HRZ

Due Date: 04/26/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.8 Cooler Temp Corrected °C: 2.8 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/13/18 *JR*

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Date: 4/13/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: Pace MN
 Project #:

WO#: 12107092
 Due Date: 04/26/18
 PM: HRZ
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 4.6 Cooler Temp Corrected °C: 4.7 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 0.1 Date and Initials of Person Examining Contents: 4-13-18, BM

Comments: Bm 4/13/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>5L</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: DID NOT RECEIVE "002". RECEIVED TWO CONTAINERS FOR 001 - SEND 1 BACK TO CITIES.
Bm 4/13/18

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Skaller Date: 4/13/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 10427018



Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427018

Workorder Name: 18-00383 MPCA-Freeway LF Solid

Owner Received Date: 4/11/2018 Results Requested By: 4/26/2018

Report To		Subcontract To				Requested Analysis																	
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Fluoride by method 9056								LAB USE ONLY				
						Unpreserved																	
1	FD-TT-01 (10-12 WM)	PS	4/11/2018 10:20	10427018001	Solid	1					X												
2	FD-TT-02 (7-9 WM)	PS	4/11/2018 12:20	10427018002	Solid	1					X												
3	FD-SB-A1 (3-6 S)	PS	4/11/2018 13:00	10427018003	Solid	1					X												
4	FD-SB-B1 (11-13 WM)	PS	4/11/2018 13:50	10427018004	Solid	1					X												
5	FD-SB-C1 (5-8 WM)	PS	4/11/2018 14:30	10427018005	Solid	1					X												
6	FD-TT-03 (2-5 WM)	PS	4/11/2018 14:50	10427018006	Solid	1					X												
7	FD-SB-D1 (11-16 WM)	PS	4/11/2018 15:35	10427018007	Solid	1					X												
8	FD-SB-E1 (10-15 WM)	PS	4/11/2018 16:10	10427018008	Solid	1					X												
												Comments											
Transfers		Released By		Date/Time		Received By		Date/Time															
1		/Pace		04/12/18 11:17		DJ CLP		4-12-18 1900		Samples also sent to Pace - Duluth.													
2		CLP		4-12-18 2330		DJ CLP		4-12-18 1415															
3		CLP		4-13-18 1800		M. P. Pace		4-13-18 1800															
Cooler Temperature on Receipt			3.8 °C			Custody Seal			Y or N			Received on Ice			D or N			Samples Intact			Y or N		

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

returning - 001

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN

Project #:

Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Tracking #: 1691218-1

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 60 Type of Ice: Wet Blue Dry None

Cooler Temperature Uncorr: 3 ICorr: 3.5

Samples on ice, cooling process has begun

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 4/13/18
Initials: RS

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRWO RS 4/13/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>no times on client labels RS 4/13/18</u>
-Includes date/time/ID/Analysis Matrix:	<u>3</u>	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: CS

Date: 4/13/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194478 **Date/Time and Initials of person examining contents:** _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 1647

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No ^{see 4/6-3/18}

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 0 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 4.5°C / 4.5°C **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/		All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			/
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<u>N/A</u>
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments: _____

Sample Container Count

WO#: 50194478



50194478

CLIENT: PACE wv

COC PAGE 1 of 1

COC ID# _____

Project # 50194478

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	SBS	Bulk Kit	Matrix SI/ (Soil/Wat Aqueous	pH <2	pH >9	pH >12
1								1													31			
2								1																
3								1																
4								1																
5								1																
6								1																
7								1																
8								1																
9																								
10																								
11																								
12																								

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VG9V	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VG9W	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 25, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427018
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-01 (10-12 WM) (10427018001)	A181603-01	Solid	04/11/2018	04/13/2018
FD-TT-02 (7-9 WM) (10427018002)	A181603-02	Solid	04/11/2018	04/17/2018
FD-SB-A1 (3-6 S) (10427018003)	A181603-03	Solid	04/11/2018	04/13/2018
FD-SB-B1 (11-13 WM) (10427018004)	A181603-04	Solid	04/11/2018	04/17/2018
FD-SB-C1 (5-8 WM) (10427018005)	A181603-05	Solid	04/11/2018	04/13/2018
FD-TT-03 (2-5 WM) (10427018006)	A181603-06	Solid	04/11/2018	04/17/2018
FD-SB-D1 (11-16 WM) (10427018007)	A181603-07	Solid	04/11/2018	04/13/2018
FD-SB-E1 (10-15 WM) (10427018008)	A181603-08	Solid	04/11/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

4 samples were received on 04/13/2018 and 4 samples were received on 04/17/2018. Samples were received at 5.8 and 1.8 degrees Celsius. Samples were received in acceptable condition, with the exception of one label discrepancy.

Sample A181603-06 had a discrepancy between the sample description on the chain of custody (COC) and the sample description on the container. Per the client, the COC sample description is correct.

Please see the COC document at the end of this report for additional information.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427018 Project Manager: Jennifer Anderson
--	--

FD-TT-01 (10-12 WM) (10427018001)

Date Sampled

A181603-01 (Solid)

04/11/2018 10:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	0.13	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:40	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:40	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:15	EPA 8321B	

Surrogate: DCAA

90.5 % 70.8-116

04/20/2018

04/21/2018 12:15

EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	72.4	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-TT-02 (7-9 WM) (10427018002)
A181603-02 (Solid)

Date Sampled
 04/11/2018 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	
2,4-DB	0.12	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	P
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:46	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:46	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:46	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 12:46	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	
Picloram	0.16	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 13:22	EPA 8321B	
Surrogate: DCAA		82.1 %	70.8-116		04/20/2018	04/21/2018 13:22	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	61.3	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427018 Project Manager: Jennifer Anderson
--	--

FD-SB-A1 (3-6 S) (10427018003)

A181603-03 (Solid)

Date Sampled
 04/11/2018 13:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:29	EPA 8321B	

Surrogate: DCAA 64.4 % 70.8-116 04/20/2018 04/21/2018 14:29 EPA 8321B S

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	71.6	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 608.221.8700 Phone
 608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-SB-B1 (11-13 WM) (10427018004)

A181603-04 (Solid)

Date Sampled
04/11/2018 13:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 14:57	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 15:36	EPA 8321B	
Surrogate: DCAA		92.5 %		70.8-116	04/20/2018	04/21/2018 15:36	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	80.6	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-SB-C1 (5-8 WM) (10427018005)
A181603-05 (Solid)

Date Sampled
 04/11/2018 14:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:15	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:15	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 18:57	EPA 8321B	
Surrogate: DCAA		90.1 %		70.8-116	04/20/2018	04/21/2018 18:57	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	83.5	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 608.221.8700 Phone
 608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

FD-SB-E1 (10-15 WM) (10427018008)
A181603-08 (Solid)

Date Sampled
 04/11/2018 16:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:33	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 21:33	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 22:18	EPA 8321B	
Surrogate: DCAA		87.0 %		70.8-116	04/20/2018	04/21/2018 22:18	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	86.0	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 608.221.8700 Phone
 608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

Blank (A804171-BLK1)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 18:21										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	21.2		mg/kg wet	20.00		106	70.8-116			
Surrogate: DCAA [2C]	19.0		mg/kg wet	20.00		95.3	62.3-114			

LCS (A804171-BS1)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 17:14										
2,4-D	1.92	0.10	mg/kg wet	2.000		96.2	81.6-107			
2,4-D [2C]	1.66	0.10	mg/kg wet	2.000		83.2	71.8-120			
2,4-DB	1.77	0.10	mg/kg wet	2.000		88.7	76.4-107			
2,4-DB [2C]	1.69	0.10	mg/kg wet	2.000		84.5	62.2-129			
2,4,5-T	1.93	0.10	mg/kg wet	2.000		96.6	81.2-110			
2,4,5-T [2C]	1.88	0.10	mg/kg wet	2.000		93.8	70.6-125			
2,4,5-TP	1.87	0.10	mg/kg wet	2.000		93.5	79.1-106			
2,4,5-TP [2C]	1.69	0.10	mg/kg wet	2.000		84.4	68.2-118			
Bentazon	1.07	0.10	mg/kg wet	1.000		107	82.5-119			
Bentazon [2C]	0.806	0.10	mg/kg wet	1.000		80.6	73.3-125			
Dicamba	1.98	0.10	mg/kg wet	2.000		98.8	85.1-108			
Dicamba [2C]	1.85	0.10	mg/kg wet	2.000		92.4	71.4-115			
Picloram	0.991	0.10	mg/kg wet	1.000		99.1	86.1-106			
Picloram [2C]	0.878	0.10	mg/kg wet	1.000		87.8	74.5-114			
Triclopyr	1.89	0.10	mg/kg wet	2.000		94.4	78.6-106			
Triclopyr [2C]	1.67	0.10	mg/kg wet	2.000		83.4	69.4-118			
Surrogate: DCAA	20.9		mg/kg wet	20.00		105	70.8-116			
Surrogate: DCAA [2C]	18.7		mg/kg wet	20.00		93.5	62.3-114			

LCS (A804171-BS2)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 16:07										
MCPA	2.15	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	1.92	0.10	mg/kg wet	2.000		96.2	77-123			



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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427018
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

LCS (A804171-BS2)

Prepared: 04/20/2018 Analyzed: 04/20/2018 16:07

Surrogate: DCAA	21.1		mg/kg wet	20.00		106	70.8-116			
Surrogate: DCAA [2C]	21.1		mg/kg wet	20.00		105	62.3-114			

Matrix Spike (A804171-MS1)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/20/2018 22:50

2,4-D	1.92	0.10	mg/kg dry	2.156	ND	89.2	71.4-105			
2,4-D [2C]	1.82	0.10	mg/kg dry	2.156	0.0525	81.8	50.5-123			
2,4-DB	1.86	0.10	mg/kg dry	2.156	ND	86.1	46.4-117			
2,4-DB [2C]	1.72	0.10	mg/kg dry	2.156	ND	79.7	44.5-121			
2,4,5-T	2.03	0.10	mg/kg dry	2.156	ND	94.1	66.2-110			
2,4,5-T [2C]	1.94	0.10	mg/kg dry	2.156	ND	90.0	43.6-126			
2,4,5-TP	1.97	0.10	mg/kg dry	2.156	ND	91.3	52.4-114			
2,4,5-TP [2C]	1.83	0.10	mg/kg dry	2.156	ND	85.0	47.6-117			
Bentazon	1.02	0.10	mg/kg dry	1.078	0.0456	90.9	61.5-117			
Bentazon [2C]	0.920	0.10	mg/kg dry	1.078	ND	85.3	50.7-127			
Dicamba	1.59	0.10	mg/kg dry	2.156	ND	73.9	48.4-111			
Dicamba [2C]	1.56	0.10	mg/kg dry	2.156	ND	72.3	43.3-108			
Picloram	0.633	0.10	mg/kg dry	1.078	ND	58.7	26.7-110			
Picloram [2C]	0.389	0.10	mg/kg dry	1.078	0.0164	34.6	10.8-110			
Triclopyr	1.95	0.10	mg/kg dry	2.156	ND	90.7	56-113			
Triclopyr [2C]	1.78	0.10	mg/kg dry	2.156	0.0278	81.2	47.9-120			
Surrogate: DCAA	21.4		mg/kg dry	21.56		99.2	70.8-116			
Surrogate: DCAA [2C]	19.1		mg/kg dry	21.56		88.6	62.3-114			

Matrix Spike (A804171-MS2)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/21/2018 01:04

MCPA	2.22	0.10	mg/kg dry	2.156	ND	103	74.2-114			
MCPA [2C]	2.11	0.10	mg/kg dry	2.156	ND	97.8	60.9-122			
Surrogate: DCAA	21.5		mg/kg dry	21.56		99.6	70.8-116			
Surrogate: DCAA [2C]	21.8		mg/kg dry	21.56		101	62.3-114			

Matrix Spike Dup (A804171-MSD1)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/20/2018 23:57

2,4-D	1.96	0.10	mg/kg dry	2.156	ND	90.7	71.4-105	1.67	20	
2,4-D [2C]	1.88	0.10	mg/kg dry	2.156	0.0525	84.8	50.5-123	3.52	20	
2,4-DB	1.86	0.10	mg/kg dry	2.156	ND	86.1	46.4-117	0.0708	20	
2,4-DB [2C]	1.81	0.10	mg/kg dry	2.156	ND	84.1	44.5-121	5.40	20	
2,4,5-T	2.01	0.10	mg/kg dry	2.156	ND	93.3	66.2-110	0.865	20	
2,4,5-T [2C]	1.92	0.10	mg/kg dry	2.156	ND	89.0	43.6-126	1.06	20	
2,4,5-TP	1.95	0.10	mg/kg dry	2.156	ND	90.3	52.4-114	1.05	20	
2,4,5-TP [2C]	1.83	0.10	mg/kg dry	2.156	ND	84.9	47.6-117	0.106	20	
Bentazon	1.04	0.10	mg/kg dry	1.078	0.0456	92.2	61.5-117	1.44	20	
Bentazon [2C]	0.960	0.10	mg/kg dry	1.078	ND	89.1	50.7-127	4.28	20	
Dicamba	1.62	0.10	mg/kg dry	2.156	ND	74.9	48.4-111	1.41	20	
Dicamba [2C]	1.60	0.10	mg/kg dry	2.156	ND	74.1	43.3-108	2.52	20	
Picloram	0.641	0.10	mg/kg dry	1.078	ND	59.5	26.7-110	1.30	20	
Picloram [2C]	0.387	0.10	mg/kg dry	1.078	0.0164	34.4	10.8-110	0.574	20	



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 608.221.8700 Phone
 608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427018
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

Matrix Spike Dup (A804171-MSD1)		Source: A181607-08			Prepared: 04/20/2018 Analyzed: 04/20/2018 23:57					
Triclopyr	1.97	0.10	mg/kg dry	2.156	ND	91.4	56-113	0.809	20	
Triclopyr [2C]	1.78	0.10	mg/kg dry	2.156	0.0278	81.1	47.9-120	0.221	20	
Surrogate: DCAA	21.2		mg/kg dry	21.56		98.4	70.8-116			
Surrogate: DCAA [2C]	18.9		mg/kg dry	21.56		87.9	62.3-114			
Matrix Spike Dup (A804171-MSD2)		Source: A181607-08			Prepared: 04/20/2018 Analyzed: 04/21/2018 02:11					
MCPA	2.21	0.10	mg/kg dry	2.156	ND	103	74.2-114	0.307	20	
MCPA [2C]	2.08	0.10	mg/kg dry	2.156	ND	96.5	60.9-122	1.37	20	
Surrogate: DCAA	21.6		mg/kg dry	21.56		100	70.8-116			
Surrogate: DCAA [2C]	21.9		mg/kg dry	21.56		102	62.3-114			



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 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427018 Project Manager: Jennifer Anderson
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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804163 - % Solids

Duplicate (A804163-DUP1)	Source: A181607-09		Prepared: 04/18/2018 Analyzed: 04/19/2018 11:20							
% Solids	90.0	0.00	% by Weight		90.3			0.390	20	



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608.221.8700 Phone
608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427018
Project Manager: Jennifer Anderson

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- P The difference in the concentrations between the primary and confirmation column was > 40%.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

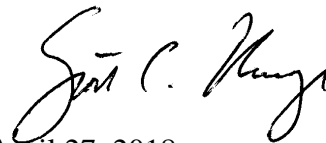
PaceProject#: 10427280
Sample Receipt Date: 04/13/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 27, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 27, 2018

DISCUSSION

This report presents the results from the analyses performed on five samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 45-64%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 104%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10427280

Appendix A

Sample Management

WO#: 10427280



10427280



Minnesota Pollution Control Agency

Chain-of-Custody Form

Work Order Number:

Turnaround Time:

COC ID:

LABORATORY

FOR LAB USE ONLY

Facility Code: *MPCA-Freeway LF 50/16* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA-Freeway LF 50/16* Project Task Code:

Address:

*18-00383
Epic Profile # 38716*

Project Manager:

Phone No:

Potential Hazard? If yes, add information to Sampler Comments Section

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

S-Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES
DW=Drinking Water
NWP=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES
W-Ground-Groundwater
WS-Surf-Surface Water
QC-BLANK=Artificial Blank Water
L=Leachate/Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in / feet	End Depth, in / feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
<i>FD-5B-F1 (10-14.5)</i>	<i>S</i>	<i>4/12/18</i>	<i>1015</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>Sealed for soils/water (-Dioxins)</i>	<i>001</i>	<i>1</i>
<i>FD-5B-E1 (3-10.5)</i>	<i>S</i>	<i>4/12/18</i>	<i>1045</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>2</i>
<i>FD-1T-05 (4-9 w/m)</i>	<i>S</i>	<i>4/12/18</i>	<i>0945</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>X</i>	<i>3</i>
<i>FD-1T-06 (2-3 w/m)</i>	<i>S</i>	<i>4/12/18</i>	<i>1145</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>4</i>
<i>FD-1T-07 (6-11 w/m)</i>	<i>S</i>	<i>4/12/18</i>	<i>1300</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>X</i>	<i>5</i>
<i>FD-1T-08 (5-12 w/m)</i>	<i>S</i>	<i>4/12/18</i>	<i>1430</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>6</i>
<i>FS-5B-01 (5-9 w/m)</i>	<i>S</i>	<i>4/12/18</i>	<i>1720</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>X</i>	<i>7</i>
<i>FS-5B-02 (5-10.5)</i>	<i>S</i>	<i>4/12/18</i>	<i>1910</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>004</i>	<i>8</i>
<i>FS-5B-03 (1.5-3.0.5)</i>	<i>S</i>	<i>4/12/18</i>	<i>1935</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>005</i>	<i>9</i>
														<i>10</i>

4/13/18 JD
4/13/18 JD

Sampled By: *David Anderson*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / Pace Analytical</i>	<i>4/13/18/0745</i>	<i>Don Payne</i>	<i>4/13/18 800</i>

T=3.1

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

WO#: 10427280

PM: SCU Due Date: 04/27/18
 CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No

Thermometer 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Used: G87A9155100842 Cooler Temp Read (°C): 2.9 Cooler Temp Corrected (°C): 3.1 Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C Correction Factor: 1.02 Date and Initials of Person Examining Contents: PG 4/13/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. <u>No time on label</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Head space in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Field Data Required? Yes No

Project Manager Review: [Signature] Date: 04/13/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427280

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-F1 (10-14.5 S)		
Lab Sample ID	10427280001		
Filename	U180422B_08		
Injected By	BAL		
Total Amount Extracted	15.0 g	Matrix	Solid
% Moisture	32.6	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	04/12/2018 10:15
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 19:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-05 (4-9 WM)		
Lab Sample ID	10427280002		
Filename	U180422B_09		
Injected By	BAL		
Total Amount Extracted	13.7 g	Matrix	Solid
% Moisture	28.0	Dilution	NA
Dry Weight Extracted	9.86 g	Collected	04/12/2018 09:45
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 20:42

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	58

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-07 (6-11 WM)		
Lab Sample ID	10427280003		
Filename	U180422B_10		
Injected By	BAL		
Total Amount Extracted	13.2 g	Matrix	Solid
% Moisture	28.0	Dilution	NA
Dry Weight Extracted	9.50 g	Collected	04/12/2018 13:00
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 21:31

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	2.7	----	1.0	2,3,7,8-TCDD-13C	2.00	60
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	TS-SB-01 (5-8 WM)		
Lab Sample ID	10427280004		
Filename	U180422B_11		
Injected By	BAL		
Total Amount Extracted	11.4 g	Matrix	Solid
% Moisture	10.4	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	04/12/2018 17:20
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 22:19

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	64
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	65

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	TS-SB-03 (1.5-3.0 S)		
Lab Sample ID	10427280005		
Filename	U180422B_12		
Injected By	BAL		
Total Amount Extracted	13.6 g	Matrix	Solid
% Moisture	12.1	Dilution	NA
Dry Weight Extracted	12.0 g	Collected	04/12/2018 19:55
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16 & U180422B_15	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/22/2018 23:07

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	45
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	47

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61774	Matrix	Solid
Filename	Y180422A_04	Dilution	NA
Total Amount Extracted	79.7 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 16:10
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61775	Matrix	Solid
Filename	Y180422A_01	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 13:59
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL
Method Blank ID	BLANK-61774		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.21	104	2,3,7,8-TCDD-13C	2.0	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 02, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Alaska Certification UST-107
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Nevada DCNR Certification #: MN000372018-1

Minnesota Dept of Health Certification #: 1382680
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427291001	FD-SB-F1 (10-14.5 S)	Solid	04/12/18 10:15	04/13/18 08:00
10427291002	FB-SB-G1 (5-10 S)	Solid	04/12/18 10:45	04/13/18 08:00
10427291003	FD-TT-05 (4-9 WM)	Solid	04/12/18 09:45	04/13/18 08:00
10427291004	FD-TT-06 (2-5 WM)	Solid	04/12/18 11:40	04/13/18 08:00
10427291005	FD-TT-07 (6-11 WM)	Solid	04/12/18 13:00	04/13/18 08:00
10427291006	FD-TT-08 (5-12 WM)	Solid	04/12/18 14:30	04/13/18 08:00
10427291007	TS-SB-01 (5-8 WM)	Solid	04/12/18 17:20	04/13/18 08:00
10427291008	TS-SB-02 (5-10 S)	Solid	04/12/18 19:10	04/13/18 08:00
10427291009	TS-SB-03 (1.5-3.0 S)	Solid	04/12/18 19:55	04/13/18 08:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427291001	FD-SB-F1 (10-14.5 S)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM, IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427291002	FB-SB-G1 (5-10 S)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427291003	FD-TT-05 (4-9 WM)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427291004	FD-TT-06 (2-5 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427291005	FD-TT-07 (6-11 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427291006	FD-TT-08 (5-12 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427291007	TS-SB-01 (5-8 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM, IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427291008	TS-SB-02 (5-10 S)	ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
		EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
EPA 8260B	CD2	70	PASI-M		
EPA 7196A	JRB	1	PASI-I		
Trivalent Chromium Calculation	SLB	1	PASI-I		
EPA 9012	DAW	1	PASI-G		
EPA 9056A	MCT	1	PASI-V		
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	13.7	1	04/25/18 10:56	04/27/18 16:00	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	309-00-2	
alpha-BHC	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	319-84-6	
beta-BHC	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	319-85-7	
delta-BHC	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	58-89-9	
Chlordane (Technical)	ND	ug/kg	24.7	1	04/16/18 10:57	04/20/18 02:15	57-74-9	
alpha-Chlordane	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	5103-74-2	
4,4'-DDD	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	72-54-8	
4,4'-DDE	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	72-55-9	
4,4'-DDT	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	50-29-3	
Dieldrin	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	60-57-1	
Endosulfan I	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	959-98-8	
Endosulfan II	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	33213-65-9	
Endosulfan sulfate	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	1031-07-8	
Endrin	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	72-20-8	
Endrin aldehyde	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	7421-93-4	
Endrin ketone	ND	ug/kg	4.9	1	04/16/18 10:57	04/20/18 02:15	53494-70-5	
Heptachlor	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.5	1	04/16/18 10:57	04/20/18 02:15	1024-57-3	
Methoxychlor	ND	ug/kg	24.7	1	04/16/18 10:57	04/20/18 02:15	72-43-5	
Toxaphene	ND	ug/kg	74.0	1	04/16/18 10:57	04/20/18 02:15	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	96	%	30-150	1	04/16/18 10:57	04/20/18 02:15	877-09-8	
Decachlorobiphenyl (S)	86	%	30-150	1	04/16/18 10:57	04/20/18 02:15	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	11100-14-4	
PCB, Total	ND	ug/kg	48.9	1	04/13/18 19:35	04/16/18 18:55	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	64	%	48-125	1	04/13/18 19:35	04/16/18 18:55	877-09-8	
Decachlorobiphenyl (S)	76	%	30-134	1	04/13/18 19:35	04/16/18 18:55	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	12.7	1	04/16/18 14:24	04/19/18 19:52		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	76	%	50-150	1	04/16/18 14:24	04/19/18 19:52	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.8	1	04/24/18 13:27	04/25/18 00:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/24/18 13:27	04/25/18 00:21	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10700	mg/kg	14.5	1	04/18/18 09:37	04/21/18 19:10	7429-90-5	P6
Barium	134	mg/kg	0.73	1	04/18/18 09:37	04/21/18 19:10	7440-39-3	M1
Boron	802	mg/kg	10.9	1	04/18/18 09:37	04/21/18 19:10	7440-42-8	P6
Copper	20.2	mg/kg	0.73	1	04/18/18 09:37	04/21/18 19:10	7440-50-8	
Iron	34200	mg/kg	18.2	5	04/18/18 09:37	04/23/18 18:02	7439-89-6	
Manganese	185	mg/kg	0.36	1	04/18/18 09:37	04/21/18 19:10	7439-96-5	
Nickel	22.5	mg/kg	1.5	1	04/18/18 09:37	04/21/18 19:10	7440-02-0	M1
Silver	ND	mg/kg	0.73	1	04/18/18 09:37	04/21/18 19:10	7440-22-4	
Tin	ND	mg/kg	5.5	1	04/18/18 09:37	04/21/18 19:10	7440-31-5	M1
Titanium	589	mg/kg	1.8	1	04/18/18 09:37	04/21/18 19:10	7440-32-6	P6
Zinc	180	mg/kg	1.5	1	04/18/18 09:37	04/21/18 19:10	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	53.4	mg/kg	1.3	5	04/20/18 09:20	04/21/18 01:16	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	2.1	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7440-36-0	
Arsenic	22.5	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7440-38-2	
Beryllium	3.2	mg/kg	0.28	20	04/16/18 08:41	04/16/18 16:23	7440-41-7	
Cadmium	2.4	mg/kg	0.11	20	04/16/18 08:41	04/16/18 16:23	7440-43-9	
Cobalt	6.9	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7440-48-4	
Lead	30.4	mg/kg	0.14	20	04/16/18 08:41	04/16/18 16:23	7439-92-1	
Lithium	10.2	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7439-93-2	
Selenium	5.7	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7782-49-2	
Strontium	71.4	mg/kg	0.70	20	04/16/18 08:41	04/16/18 16:23	7440-24-6	
Vanadium	117	mg/kg	1.4	20	04/16/18 08:41	04/16/18 16:23	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.075	mg/kg	0.029	1	04/18/18 09:38	04/19/18 18:17	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	32.6	%	0.10	1		04/19/18 14:07		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	83-32-9	
Acenaphthylene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	120-12-7	
Benzo(a)anthracene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	56-55-3	
Benzo(a)pyrene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	101-55-3	
Butylbenzylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	85-68-7	
Carbazole	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	59-50-7	
4-Chloroaniline	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	108-60-1	
2-Chloronaphthalene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	91-58-7	
2-Chlorophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	7005-72-3	
Chrysene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	53-70-3	
Dibenzofuran	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	120-83-2	
Diethylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	105-67-9	
Dimethylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	131-11-3	
Di-n-butylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	4660	1	04/20/18 12:55	04/24/18 15:29	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	606-20-2	
Di-n-octylphthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	117-81-7	
Fluoranthene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	206-44-0	
Fluorene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	87-68-3	
Hexachlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	118-74-1	
Hexachloroethane	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	193-39-5	
Isophorone	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	78-59-1	
1-Methylnaphthalene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	90-12-0	
2-Methylnaphthalene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1810	1	04/20/18 12:55	04/24/18 15:29		
Naphthalene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	91-20-3	
2-Nitroaniline	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	88-74-4	
3-Nitroaniline	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	99-09-2	
4-Nitroaniline	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	100-01-6	
Nitrobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	98-95-3	
2-Nitrophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	88-75-5	
4-Nitrophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	86-30-6	
Pentachlorophenol	ND	ug/kg	1830	1	04/20/18 12:55	04/24/18 15:29	87-86-5	
Phenanthrene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	85-01-8	
Phenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	108-95-2	
Pyrene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	904	1	04/20/18 12:55	04/24/18 15:29	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	58	%.	43-125	1	04/20/18 12:55	04/24/18 15:29	4165-60-0	
2-Fluorobiphenyl (S)	61	%.	30-132	1	04/20/18 12:55	04/24/18 15:29	321-60-8	
p-Terphenyl-d14 (S)	82	%.	62-125	1	04/20/18 12:55	04/24/18 15:29	1718-51-0	
Phenol-d6 (S)	66	%.	48-125	1	04/20/18 12:55	04/24/18 15:29	13127-88-3	
2-Fluorophenol (S)	65	%.	40-125	1	04/20/18 12:55	04/24/18 15:29	367-12-4	
2,4,6-Tribromophenol (S)	70	%.	60-125	1	04/20/18 12:55	04/24/18 15:29	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	83-32-9	
Acenaphthylene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	208-96-8	
Anthracene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	120-12-7	
Benzo(a)anthracene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	56-55-3	
Benzo(a)pyrene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	207-08-9	
Chrysene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	53-70-3	
Fluoranthene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	206-44-0	
Fluorene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	193-39-5	
Naphthalene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	91-20-3	
Phenanthrene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	85-01-8	
Pyrene	ND	ug/kg	14.8	1	04/18/18 17:23	04/20/18 02:20	129-00-0	

Surrogates

2-Fluorobiphenyl (S)	66	%.	42-125	1	04/18/18 17:23	04/20/18 02:20	321-60-8	
p-Terphenyl-d14 (S)	99	%.	57-125	1	04/18/18 17:23	04/20/18 02:20	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1520	1	04/24/18 10:23	04/24/18 18:50	67-64-1	
Allyl chloride	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	107-05-1	
Benzene	ND	ug/kg	30.4	1	04/24/18 10:23	04/24/18 18:50	71-43-2	
Bromobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	108-86-1	
Bromochloromethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	74-97-5	
Bromodichloromethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-27-4	
Bromoform	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-25-2	
Bromomethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	74-83-9	
2-Butanone (MEK)	ND	ug/kg	380	1	04/24/18 10:23	04/24/18 18:50	78-93-3	
n-Butylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	104-51-8	
sec-Butylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	135-98-8	
tert-Butylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	98-06-6	
Carbon tetrachloride	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	56-23-5	
Chlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	108-90-7	
Chloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-00-3	
Chloroform	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	67-66-3	
Chloromethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	74-87-3	
2-Chlorotoluene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	95-49-8	
4-Chlorotoluene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	96-12-8	
Dibromochloromethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	106-93-4	
Dibromomethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	75-71-8	
1,1-Dichloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-34-3	
1,2-Dichloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	107-06-2	
1,1-Dichloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	156-60-5	
Dichlorofluoromethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	75-43-4	
1,2-Dichloropropane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	78-87-5	
1,3-Dichloropropane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	142-28-9	
2,2-Dichloropropane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	594-20-7	
1,1-Dichloropropene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	60-29-7	
Ethylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	380	1	04/24/18 10:23	04/24/18 18:50	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	98-82-8	
p-Isopropyltoluene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	99-87-6	
Methylene Chloride	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	380	1	04/24/18 10:23	04/24/18 18:50	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-SB-F1 (10-14.5 S) **Lab ID: 10427291001** Collected: 04/12/18 10:15 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	1634-04-4	
Naphthalene	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	91-20-3	
n-Propylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	103-65-1	
Styrene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	79-34-5	
Tetrachloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	127-18-4	
Tetrahydrofuran	ND	ug/kg	3040	1	04/24/18 10:23	04/24/18 18:50	109-99-9	
Toluene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	79-00-5	
Trichloroethene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	79-01-6	
Trichlorofluoromethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	304	1	04/24/18 10:23	04/24/18 18:50	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	76.1	1	04/24/18 10:23	04/24/18 18:50	108-67-8	
Vinyl chloride	ND	ug/kg	30.4	1	04/24/18 10:23	04/24/18 18:50	75-01-4	
Xylene (Total)	ND	ug/kg	228	1	04/24/18 10:23	04/24/18 18:50	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 18:50	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	04/24/18 10:23	04/24/18 18:50	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125	1	04/24/18 10:23	04/24/18 18:50	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.5	5	04/23/18 11:09	04/24/18 13:02	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	53.4	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.57	1	04/20/18 10:25	04/20/18 13:58	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	4.1	mg/kg	0.99	1	04/18/18 14:45	04/19/18 21:46	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.0	1	04/25/18 10:56	04/27/18 16:14	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	309-00-2	
alpha-BHC	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	319-84-6	
beta-BHC	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	319-85-7	
delta-BHC	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	58-89-9	
Chlordane (Technical)	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	57-74-9	
alpha-Chlordane	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	5103-71-9	M6
gamma-Chlordane	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	5103-74-2	M6
4,4'-DDD	212	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	72-54-8	M6, R1
4,4'-DDE	87.8	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	72-55-9	M6
4,4'-DDT	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	50-29-3	M6
Dieldrin	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	60-57-1	
Endosulfan I	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	959-98-8	
Endosulfan II	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	33213-65-9	
Endosulfan sulfate	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	1031-07-8	
Endrin	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	72-20-8	
Endrin aldehyde	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	7421-93-4	
Endrin ketone	ND	ug/kg	74.2	20	04/16/18 10:57	04/19/18 23:48	53494-70-5	
Heptachlor	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	76-44-8	
Heptachlor epoxide	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	1024-57-3	M6
Methoxychlor	ND	ug/kg	37.2	20	04/16/18 10:57	04/19/18 23:48	72-43-5	
Toxaphene	ND	ug/kg	1110	20	04/16/18 10:57	04/19/18 23:48	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/16/18 10:57	04/19/18 23:48	877-09-8	2M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/16/18 10:57	04/19/18 23:48	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	11100-14-4	
PCB, Total	ND	ug/kg	36.7	1	04/13/18 19:35	04/16/18 21:01	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	48-125	1	04/13/18 19:35	04/16/18 21:01	877-09-8	
Decachlorobiphenyl (S)	80	%	30-134	1	04/13/18 19:35	04/16/18 21:01	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	68.1	mg/kg	48.2	5	04/16/18 14:24	04/19/18 18:41		T6
Surrogates								
n-Triacontane (S)	100	%	50-150	5	04/16/18 14:24	04/19/18 18:41	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.5	1	04/24/18 13:27	04/25/18 00:45		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/24/18 13:27	04/25/18 00:45	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4200	mg/kg	10.8	1	04/18/18 09:37	04/21/18 19:38	7429-90-5	
Barium	60.3	mg/kg	0.54	1	04/18/18 09:37	04/21/18 19:38	7440-39-3	
Boron	11.6	mg/kg	8.1	1	04/18/18 09:37	04/21/18 19:38	7440-42-8	
Copper	8.0	mg/kg	0.54	1	04/18/18 09:37	04/21/18 19:38	7440-50-8	
Iron	8290	mg/kg	2.7	1	04/18/18 09:37	04/21/18 19:38	7439-89-6	
Manganese	323	mg/kg	0.27	1	04/18/18 09:37	04/21/18 19:38	7439-96-5	
Nickel	10.2	mg/kg	1.1	1	04/18/18 09:37	04/21/18 19:38	7440-02-0	
Silver	ND	mg/kg	0.54	1	04/18/18 09:37	04/21/18 19:38	7440-22-4	
Tin	ND	mg/kg	4.0	1	04/18/18 09:37	04/21/18 19:38	7440-31-5	
Titanium	147	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:38	7440-32-6	
Zinc	33.1	mg/kg	1.1	1	04/18/18 09:37	04/21/18 19:38	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	11.4	mg/kg	1.0	5	04/20/18 09:20	04/21/18 01:48	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7440-36-0	
Arsenic	13.3	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7440-38-2	
Beryllium	0.30	mg/kg	0.21	20	04/16/18 08:41	04/16/18 16:26	7440-41-7	
Cadmium	0.18	mg/kg	0.084	20	04/16/18 08:41	04/16/18 16:26	7440-43-9	
Cobalt	5.2	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7440-48-4	
Lead	19.2	mg/kg	0.11	20	04/16/18 08:41	04/16/18 16:26	7439-92-1	
Lithium	3.6	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7439-93-2	
Selenium	ND	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7782-49-2	
Strontium	15.7	mg/kg	0.53	20	04/16/18 08:41	04/16/18 16:26	7440-24-6	
Vanadium	17.6	mg/kg	1.1	20	04/16/18 08:41	04/16/18 16:26	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.042	mg/kg	0.020	1	04/18/18 09:38	04/19/18 18:19	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	10.6	%	0.10	1		04/19/18 14:07		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	208-96-8	
Anthracene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	120-12-7	
Benzo(a)anthracene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	56-55-3	
Benzo(a)pyrene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	101-55-3	
Butylbenzylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	85-68-7	
Carbazole	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	59-50-7	
4-Chloroaniline	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	108-60-1	
2-Chloronaphthalene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	91-58-7	
2-Chlorophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	7005-72-3	
Chrysene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	53-70-3	
Dibenzofuran	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	120-83-2	
Diethylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	105-67-9	
Dimethylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	131-11-3	
Di-n-butylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1900	1	04/13/18 17:55	04/19/18 21:36	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	606-20-2	
Di-n-octylphthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	117-81-7	
Fluoranthene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	206-44-0	
Fluorene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	87-68-3	
Hexachlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	118-74-1	
Hexachloroethane	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	193-39-5	
Isophorone	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	78-59-1	
1-Methylnaphthalene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	737	1	04/13/18 17:55	04/19/18 21:36		
Naphthalene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	91-20-3	
2-Nitroaniline	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	88-74-4	
3-Nitroaniline	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	99-09-2	
4-Nitroaniline	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	100-01-6	
Nitrobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	98-95-3	
2-Nitrophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	88-75-5	
4-Nitrophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	86-30-6	
Pentachlorophenol	ND	ug/kg	748	1	04/13/18 17:55	04/19/18 21:36	87-86-5	
Phenanthrene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	85-01-8	
Phenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	108-95-2	
Pyrene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	369	1	04/13/18 17:55	04/19/18 21:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	62	%	43-125	1	04/13/18 17:55	04/19/18 21:36	4165-60-0	
2-Fluorobiphenyl (S)	70	%	30-132	1	04/13/18 17:55	04/19/18 21:36	321-60-8	
p-Terphenyl-d14 (S)	83	%	62-125	1	04/13/18 17:55	04/19/18 21:36	1718-51-0	
Phenol-d6 (S)	65	%	48-125	1	04/13/18 17:55	04/19/18 21:36	13127-88-3	
2-Fluorophenol (S)	63	%	40-125	1	04/13/18 17:55	04/19/18 21:36	367-12-4	
2,4,6-Tribromophenol (S)	73	%	60-125	1	04/13/18 17:55	04/19/18 21:36	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	83-32-9	
Acenaphthylene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	208-96-8	
Anthracene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	120-12-7	
Benzo(a)anthracene	84.8	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	56-55-3	
Benzo(a)pyrene	107	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	50-32-8	
Benzo(b)fluoranthene	147	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	205-99-2	
Benzo(g,h,i)perylene	79.7	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	191-24-2	
Benzo(k)fluoranthene	58.5	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	207-08-9	
Chrysene	131	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	218-01-9	
Dibenz(a,h)anthracene	29.8	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	53-70-3	
Fluoranthene	183	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	206-44-0	
Fluorene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	86-73-7	
Indeno(1,2,3-cd)pyrene	66.7	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	193-39-5	
Naphthalene	ND	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	91-20-3	
Phenanthrene	69.4	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	85-01-8	
Pyrene	183	ug/kg	22.3	2	04/13/18 17:54	04/17/18 15:39	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	91	%	42-125	2	04/13/18 17:54	04/17/18 15:39	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	100	%	57-125	2	04/13/18 17:54	04/17/18 15:39	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1080	1	04/24/18 10:23	04/24/18 19:07	67-64-1	
Allyl chloride	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	107-05-1	
Benzene	ND	ug/kg	21.6	1	04/24/18 10:23	04/24/18 19:07	71-43-2	
Bromobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	108-86-1	
Bromochloromethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	74-97-5	
Bromodichloromethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	75-27-4	
Bromoform	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	75-25-2	
Bromomethane	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	74-83-9	
2-Butanone (MEK)	ND	ug/kg	270	1	04/24/18 10:23	04/24/18 19:07	78-93-3	
n-Butylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	104-51-8	
sec-Butylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	135-98-8	
tert-Butylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	98-06-6	
Carbon tetrachloride	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	56-23-5	
Chlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	108-90-7	
Chloroethane	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	75-00-3	
Chloroform	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	67-66-3	
Chloromethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	74-87-3	
2-Chlorotoluene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	95-49-8	
4-Chlorotoluene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	96-12-8	
Dibromochloromethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	106-93-4	
Dibromomethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	75-71-8	
1,1-Dichloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	75-34-3	
1,2-Dichloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	107-06-2	
1,1-Dichloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	156-60-5	
Dichlorofluoromethane	ND	ug/kg	540	1	04/24/18 10:23	04/24/18 19:07	75-43-4	
1,2-Dichloropropane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	78-87-5	
1,3-Dichloropropane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	142-28-9	
2,2-Dichloropropane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	594-20-7	
1,1-Dichloropropene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	60-29-7	
Ethylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	270	1	04/24/18 10:23	04/24/18 19:07	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FB-SB-G1 (5-10 S) **Lab ID: 10427291002** Collected: 04/12/18 10:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	98-82-8	
p-Isopropyltoluene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	99-87-6	
Methylene Chloride	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	270	1	04/24/18 10:23	04/24/18 19:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	1634-04-4	
Naphthalene	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	91-20-3	
n-Propylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	103-65-1	
Styrene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	79-34-5	
Tetrachloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	127-18-4	
Tetrahydrofuran	ND	ug/kg	2160	1	04/24/18 10:23	04/24/18 19:07	109-99-9	
Toluene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	79-00-5	
Trichloroethene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	79-01-6	
Trichlorofluoromethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:07	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	54.0	1	04/24/18 10:23	04/24/18 19:07	108-67-8	
Vinyl chloride	ND	ug/kg	21.6	1	04/24/18 10:23	04/24/18 19:07	75-01-4	
Xylene (Total)	ND	ug/kg	162	1	04/24/18 10:23	04/24/18 19:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/24/18 10:23	04/24/18 19:07	17060-07-0	
Toluene-d8 (S)	95	%	75-125	1	04/24/18 10:23	04/24/18 19:07	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/24/18 10:23	04/24/18 19:07	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	44.9	20	04/23/18 11:09	04/24/18 13:02	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	11.4	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.39	1	04/20/18 10:25	04/20/18 13:58	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.8	mg/kg	0.99	1	04/18/18 14:45	04/19/18 22:45	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) **Lab ID: 10427291003** Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.2	1	04/25/18 10:56	04/27/18 16:07	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	309-00-2	
alpha-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	319-84-6	
beta-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	319-85-7	
delta-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	58-89-9	
Chlordane (Technical)	ND	ug/kg	116	5	04/16/18 10:57	04/20/18 04:23	57-74-9	
alpha-Chlordane	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	5103-71-9	
gamma-Chlordane	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	5103-74-2	
4,4'-DDD	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	72-54-8	
4,4'-DDE	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	72-55-9	
4,4'-DDT	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	50-29-3	
Dieldrin	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	60-57-1	
Endosulfan I	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	959-98-8	
Endosulfan II	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	33213-65-9	
Endosulfan sulfate	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	1031-07-8	
Endrin	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	72-20-8	
Endrin aldehyde	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	7421-93-4	
Endrin ketone	ND	ug/kg	23.1	5	04/16/18 10:57	04/20/18 04:23	53494-70-5	
Heptachlor	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:23	1024-57-3	
Methoxychlor	ND	ug/kg	116	5	04/16/18 10:57	04/20/18 04:23	72-43-5	
Toxaphene	ND	ug/kg	347	5	04/16/18 10:57	04/20/18 04:23	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	94	%	30-150	5	04/16/18 10:57	04/20/18 04:23	877-09-8	4M, D3
Decachlorobiphenyl (S)	92	%	30-150	5	04/16/18 10:57	04/20/18 04:23	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	11100-14-4	
PCB, Total	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 21:17	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	83	%	48-125	1	04/13/18 19:35	04/16/18 21:17	877-09-8	
Decachlorobiphenyl (S)	74	%	30-134	1	04/13/18 19:35	04/16/18 21:17	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	33.7	mg/kg	23.6	2	04/16/18 14:24	04/20/18 09:13		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) Lab ID: 10427291003 Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	94	%	50-150	2	04/16/18 14:24	04/20/18 09:13	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.4	1	04/24/18 13:27	04/25/18 01:09		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/24/18 13:27	04/25/18 01:09	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7800	mg/kg	13.5	1	04/18/18 09:37	04/21/18 19:41	7429-90-5	
Barium	129	mg/kg	0.67	1	04/18/18 09:37	04/21/18 19:41	7440-39-3	
Boron	106	mg/kg	10.1	1	04/18/18 09:37	04/21/18 19:41	7440-42-8	
Copper	16.9	mg/kg	0.67	1	04/18/18 09:37	04/21/18 19:41	7440-50-8	
Iron	26400	mg/kg	16.8	5	04/18/18 09:37	04/24/18 18:42	7439-89-6	
Manganese	365	mg/kg	0.34	1	04/18/18 09:37	04/21/18 19:41	7439-96-5	
Nickel	18.4	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:41	7440-02-0	
Silver	ND	mg/kg	0.67	1	04/18/18 09:37	04/21/18 19:41	7440-22-4	
Tin	ND	mg/kg	5.1	1	04/18/18 09:37	04/21/18 19:41	7440-31-5	
Titanium	432	mg/kg	1.7	1	04/18/18 09:37	04/21/18 19:41	7440-32-6	
Zinc	117	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:41	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	42.6	mg/kg	1.3	5	04/20/18 09:20	04/21/18 01:53	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.0	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7440-36-0	
Arsenic	14.8	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7440-38-2	
Beryllium	1.8	mg/kg	0.27	20	04/16/18 08:41	04/16/18 16:29	7440-41-7	
Cadmium	1.4	mg/kg	0.11	20	04/16/18 08:41	04/16/18 16:29	7440-43-9	
Cobalt	5.2	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7440-48-4	
Lead	18.2	mg/kg	0.14	20	04/16/18 08:41	04/16/18 16:29	7439-92-1	
Lithium	8.6	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7439-93-2	
Selenium	2.0	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7782-49-2	
Strontium	49.0	mg/kg	0.68	20	04/16/18 08:41	04/16/18 16:29	7440-24-6	
Vanadium	76.5	mg/kg	1.4	20	04/16/18 08:41	04/16/18 16:29	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.057	mg/kg	0.026	1	04/18/18 09:38	04/19/18 18:21	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	28.0	%	0.10	1		04/19/18 15:12		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	83-32-9	
Acenaphthylene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) Lab ID: 10427291003 Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	120-12-7	
Benzo(a)anthracene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	56-55-3	
Benzo(a)pyrene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	101-55-3	
Butylbenzylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	85-68-7	
Carbazole	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	59-50-7	
4-Chloroaniline	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	108-60-1	
2-Chloronaphthalene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	91-58-7	
2-Chlorophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	7005-72-3	
Chrysene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	53-70-3	
Dibenzofuran	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	120-83-2	
Diethylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	105-67-9	
Dimethylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	131-11-3	
Di-n-butylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2350	1	04/13/18 17:55	04/19/18 17:49	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	606-20-2	
Di-n-octylphthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	117-81-7	
Fluoranthene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	206-44-0	
Fluorene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	87-68-3	
Hexachlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	118-74-1	
Hexachloroethane	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	193-39-5	
Isophorone	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	78-59-1	
1-Methylnaphthalene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	90-12-0	
2-Methylnaphthalene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) Lab ID: 10427291003 Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	914	1	04/13/18 17:55	04/19/18 17:49		
Naphthalene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	91-20-3	
2-Nitroaniline	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	88-74-4	
3-Nitroaniline	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	99-09-2	
4-Nitroaniline	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	100-01-6	
Nitrobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	98-95-3	
2-Nitrophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	88-75-5	
4-Nitrophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	86-30-6	
Pentachlorophenol	ND	ug/kg	928	1	04/13/18 17:55	04/19/18 17:49	87-86-5	
Phenanthrene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	85-01-8	
Phenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	108-95-2	
Pyrene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	457	1	04/13/18 17:55	04/19/18 17:49	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	68	%.	43-125	1	04/13/18 17:55	04/19/18 17:49	4165-60-0	
2-Fluorobiphenyl (S)	70	%.	30-132	1	04/13/18 17:55	04/19/18 17:49	321-60-8	
p-Terphenyl-d14 (S)	83	%.	62-125	1	04/13/18 17:55	04/19/18 17:49	1718-51-0	
Phenol-d6 (S)	70	%.	48-125	1	04/13/18 17:55	04/19/18 17:49	13127-88-3	
2-Fluorophenol (S)	68	%.	40-125	1	04/13/18 17:55	04/19/18 17:49	367-12-4	
2,4,6-Tribromophenol (S)	70	%.	60-125	1	04/13/18 17:55	04/19/18 17:49	118-79-6	
8270D MSSV PAH by SIM								
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	83-32-9	
Acenaphthylene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	208-96-8	
Anthracene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	120-12-7	
Benzo(a)anthracene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	56-55-3	
Benzo(a)pyrene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	50-32-8	
Benzo(b)fluoranthene	16.7	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	207-08-9	
Chrysene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	53-70-3	
Fluoranthene	19.2	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	206-44-0	
Fluorene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	193-39-5	
Naphthalene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	91-20-3	
Phenanthrene	ND	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	85-01-8	
Pyrene	16.7	ug/kg	13.8	1	04/13/18 17:54	04/17/18 14:58	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	71	%.	42-125	1	04/13/18 17:54	04/17/18 14:58	321-60-8	
p-Terphenyl-d14 (S)	77	%.	57-125	1	04/13/18 17:54	04/17/18 14:58	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) Lab ID: 10427291003 Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1440	1	04/24/18 10:23	04/24/18 19:24	67-64-1	
Allyl chloride	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	107-05-1	
Benzene	ND	ug/kg	28.7	1	04/24/18 10:23	04/24/18 19:24	71-43-2	
Bromobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	108-86-1	
Bromochloromethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	74-97-5	
Bromodichloromethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	75-27-4	
Bromoform	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	75-25-2	
Bromomethane	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	74-83-9	
2-Butanone (MEK)	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:24	78-93-3	
n-Butylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	104-51-8	
sec-Butylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	135-98-8	
tert-Butylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	98-06-6	
Carbon tetrachloride	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	56-23-5	
Chlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	108-90-7	
Chloroethane	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	75-00-3	
Chloroform	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	67-66-3	
Chloromethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	74-87-3	
2-Chlorotoluene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	95-49-8	
4-Chlorotoluene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	96-12-8	
Dibromochloromethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	106-93-4	
Dibromomethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	75-71-8	
1,1-Dichloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	75-34-3	
1,2-Dichloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	107-06-2	
1,1-Dichloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	156-60-5	
Dichlorofluoromethane	ND	ug/kg	718	1	04/24/18 10:23	04/24/18 19:24	75-43-4	
1,2-Dichloropropane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	78-87-5	
1,3-Dichloropropane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	142-28-9	
2,2-Dichloropropane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	594-20-7	
1,1-Dichloropropene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	60-29-7	
Ethylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:24	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	98-82-8	
p-Isopropyltoluene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	99-87-6	
Methylene Chloride	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:24	108-10-1	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-05 (4-9 WM) **Lab ID: 10427291003** Collected: 04/12/18 09:45 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	1634-04-4	
Naphthalene	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	91-20-3	
n-Propylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	103-65-1	
Styrene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	79-34-5	
Tetrachloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	127-18-4	
Tetrahydrofuran	ND	ug/kg	2870	1	04/24/18 10:23	04/24/18 19:24	109-99-9	
Toluene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	79-00-5	
Trichloroethene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	79-01-6	
Trichlorofluoromethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 19:24	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	71.8	1	04/24/18 10:23	04/24/18 19:24	108-67-8	
Vinyl chloride	ND	ug/kg	28.7	1	04/24/18 10:23	04/24/18 19:24	75-01-4	
Xylene (Total)	ND	ug/kg	216	1	04/24/18 10:23	04/24/18 19:24	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 19:24	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 19:24	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	04/24/18 10:23	04/24/18 19:24	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	14.0	5	04/23/18 11:09	04/24/18 13:02	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	42.6	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.47	1	04/20/18 10:25	04/20/18 14:01	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	4.3	mg/kg	0.98	1	04/18/18 14:45	04/19/18 23:44	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **FD-TT-06 (2-5 WM)** Lab ID: **10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.6	1	04/25/18 10:56	04/27/18 16:34	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	309-00-2	
alpha-BHC	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	319-84-6	
beta-BHC	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	319-85-7	
delta-BHC	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	58-89-9	
Chlordane (Technical)	ND	ug/kg	27.6	1	04/16/18 10:57	04/20/18 02:33	57-74-9	
alpha-Chlordane	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	5103-74-2	
4,4'-DDD	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	72-54-8	
4,4'-DDE	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	72-55-9	
4,4'-DDT	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	50-29-3	
Dieldrin	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	60-57-1	
Endosulfan I	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	959-98-8	
Endosulfan II	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	33213-65-9	
Endosulfan sulfate	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	1031-07-8	
Endrin	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	72-20-8	
Endrin aldehyde	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	7421-93-4	
Endrin ketone	ND	ug/kg	5.5	1	04/16/18 10:57	04/20/18 02:33	53494-70-5	
Heptachlor	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.8	1	04/16/18 10:57	04/20/18 02:33	1024-57-3	
Methoxychlor	ND	ug/kg	27.6	1	04/16/18 10:57	04/20/18 02:33	72-43-5	
Toxaphene	ND	ug/kg	82.7	1	04/16/18 10:57	04/20/18 02:33	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	96	%	30-150	1	04/16/18 10:57	04/20/18 02:33	877-09-8	
Decachlorobiphenyl (S)	86	%	30-150	1	04/16/18 10:57	04/20/18 02:33	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11097-69-1	
PCB-1260 (Aroclor 1260)	118	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	11100-14-4	
PCB, Total	118	ug/kg	54.6	1	04/13/18 19:35	04/16/18 21:33	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	83	%	48-125	1	04/13/18 19:35	04/16/18 21:33	877-09-8	
Decachlorobiphenyl (S)	76	%	30-134	1	04/13/18 19:35	04/16/18 21:33	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	119	mg/kg	14.2	1	04/16/18 14:24	04/19/18 18:48		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) **Lab ID: 10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	94	%	50-150	1	04/16/18 14:24	04/19/18 18:48	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	17.4	1	04/24/18 13:27	04/25/18 01:33		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/24/18 13:27	04/25/18 01:33	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	29600	mg/kg	16.3	1	04/18/18 09:37	04/21/18 19:45	7429-90-5	
Barium	138	mg/kg	0.81	1	04/18/18 09:37	04/21/18 19:45	7440-39-3	
Boron	192	mg/kg	12.2	1	04/18/18 09:37	04/21/18 19:45	7440-42-8	
Copper	1660	mg/kg	0.81	1	04/18/18 09:37	04/21/18 19:45	7440-50-8	
Iron	31800	mg/kg	20.3	5	04/18/18 09:37	04/24/18 18:44	7439-89-6	
Manganese	251	mg/kg	0.41	1	04/18/18 09:37	04/21/18 19:45	7439-96-5	
Nickel	489	mg/kg	1.6	1	04/18/18 09:37	04/21/18 19:45	7440-02-0	
Silver	ND	mg/kg	0.81	1	04/18/18 09:37	04/21/18 19:45	7440-22-4	
Tin	29.9	mg/kg	6.1	1	04/18/18 09:37	04/21/18 19:45	7440-31-5	
Titanium	405	mg/kg	2.0	1	04/18/18 09:37	04/21/18 19:45	7440-32-6	
Zinc	320	mg/kg	1.6	1	04/18/18 09:37	04/21/18 19:45	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	38.5	mg/kg	1.5	5	04/20/18 09:20	04/21/18 01:57	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	0.99	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7440-36-0	
Arsenic	18.3	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7440-38-2	
Beryllium	2.4	mg/kg	0.33	20	04/16/18 08:41	04/16/18 15:41	7440-41-7	
Cadmium	2.1	mg/kg	0.13	20	04/16/18 08:41	04/16/18 15:41	7440-43-9	
Cobalt	7.2	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7440-48-4	
Lead	75.8	mg/kg	0.16	20	04/16/18 08:41	04/16/18 15:41	7439-92-1	
Lithium	9.9	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7439-93-2	
Selenium	3.7	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7782-49-2	
Strontium	51.0	mg/kg	0.81	20	04/16/18 08:41	04/16/18 15:41	7440-24-6	
Vanadium	69.5	mg/kg	1.6	20	04/16/18 08:41	04/16/18 15:41	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	1.7	mg/kg	0.062	2	04/18/18 09:38	04/19/18 18:42	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	39.7	%	0.10	1		04/19/18 15:12		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	83-32-9	
Acenaphthylene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) **Lab ID: 10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	120-12-7	
Benzo(a)anthracene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	56-55-3	
Benzo(a)pyrene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	101-55-3	
Butylbenzylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	85-68-7	
Carbazole	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	59-50-7	
4-Chloroaniline	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	108-60-1	
2-Chloronaphthalene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	91-58-7	
2-Chlorophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	7005-72-3	
Chrysene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	53-70-3	
Dibenzofuran	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	120-83-2	
Diethylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	105-67-9	
Dimethylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	131-11-3	
Di-n-butylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2810	1	04/20/18 12:55	04/24/18 15:57	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	606-20-2	
Di-n-octylphthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	117-81-7	
Fluoranthene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	206-44-0	
Fluorene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	87-68-3	
Hexachlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	118-74-1	
Hexachloroethane	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	193-39-5	
Isophorone	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	78-59-1	
1-Methylnaphthalene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	90-12-0	
2-Methylnaphthalene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) **Lab ID: 10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1090	1	04/20/18 12:55	04/24/18 15:57		
Naphthalene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	91-20-3	
2-Nitroaniline	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	88-74-4	
3-Nitroaniline	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	99-09-2	
4-Nitroaniline	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	100-01-6	
Nitrobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	98-95-3	
2-Nitrophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	88-75-5	
4-Nitrophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	86-30-6	
Pentachlorophenol	ND	ug/kg	1110	1	04/20/18 12:55	04/24/18 15:57	87-86-5	
Phenanthrene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	85-01-8	
Phenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	108-95-2	
Pyrene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	546	1	04/20/18 12:55	04/24/18 15:57	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	51	%.	43-125	1	04/20/18 12:55	04/24/18 15:57	4165-60-0	
2-Fluorobiphenyl (S)	61	%.	30-132	1	04/20/18 12:55	04/24/18 15:57	321-60-8	
p-Terphenyl-d14 (S)	90	%.	62-125	1	04/20/18 12:55	04/24/18 15:57	1718-51-0	
Phenol-d6 (S)	54	%.	48-125	1	04/20/18 12:55	04/24/18 15:57	13127-88-3	
2-Fluorophenol (S)	52	%.	40-125	1	04/20/18 12:55	04/24/18 15:57	367-12-4	
2,4,6-Tribromophenol (S)	81	%.	60-125	1	04/20/18 12:55	04/24/18 15:57	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	83-32-9	
Acenaphthylene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	208-96-8	
Anthracene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	120-12-7	
Benzo(a)anthracene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	56-55-3	
Benzo(a)pyrene	17.9	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	50-32-8	
Benzo(b)fluoranthene	23.1	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	207-08-9	
Chrysene	21.9	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	53-70-3	
Fluoranthene	18.6	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	206-44-0	
Fluorene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	193-39-5	
Naphthalene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	91-20-3	
Phenanthrene	ND	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	85-01-8	
Pyrene	23.8	ug/kg	16.5	1	04/13/18 17:54	04/16/18 20:27	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	72	%.	42-125	1	04/13/18 17:54	04/16/18 20:27	321-60-8	
p-Terphenyl-d14 (S)	79	%.	57-125	1	04/13/18 17:54	04/16/18 20:27	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) **Lab ID:** 10427291004 Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1800	1	04/24/18 10:23	04/24/18 19:41	67-64-1	
Allyl chloride	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	107-05-1	
Benzene	ND	ug/kg	35.9	1	04/24/18 10:23	04/24/18 19:41	71-43-2	
Bromobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	108-86-1	
Bromochloromethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	74-97-5	
Bromodichloromethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	75-27-4	
Bromoform	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	75-25-2	
Bromomethane	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	74-83-9	
2-Butanone (MEK)	ND	ug/kg	449	1	04/24/18 10:23	04/24/18 19:41	78-93-3	
n-Butylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	104-51-8	
sec-Butylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	135-98-8	
tert-Butylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	98-06-6	
Carbon tetrachloride	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	56-23-5	
Chlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	108-90-7	
Chloroethane	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	75-00-3	
Chloroform	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	67-66-3	
Chloromethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	74-87-3	
2-Chlorotoluene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	95-49-8	
4-Chlorotoluene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	96-12-8	
Dibromochloromethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	106-93-4	
Dibromomethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	75-71-8	
1,1-Dichloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	75-34-3	
1,2-Dichloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	107-06-2	
1,1-Dichloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	156-60-5	
Dichlorofluoromethane	ND	ug/kg	898	1	04/24/18 10:23	04/24/18 19:41	75-43-4	
1,2-Dichloropropane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	78-87-5	
1,3-Dichloropropane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	142-28-9	
2,2-Dichloropropane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	594-20-7	
1,1-Dichloropropene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	60-29-7	
Ethylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	449	1	04/24/18 10:23	04/24/18 19:41	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	98-82-8	
p-Isopropyltoluene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	99-87-6	
Methylene Chloride	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	449	1	04/24/18 10:23	04/24/18 19:41	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-06 (2-5 WM) **Lab ID: 10427291004** Collected: 04/12/18 11:40 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	1634-04-4	
Naphthalene	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	91-20-3	
n-Propylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	103-65-1	
Styrene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	79-34-5	
Tetrachloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	127-18-4	
Tetrahydrofuran	ND	ug/kg	3590	1	04/24/18 10:23	04/24/18 19:41	109-99-9	
Toluene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	79-00-5	
Trichloroethene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	79-01-6	
Trichlorofluoromethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	359	1	04/24/18 10:23	04/24/18 19:41	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	89.8	1	04/24/18 10:23	04/24/18 19:41	108-67-8	
Vinyl chloride	ND	ug/kg	35.9	1	04/24/18 10:23	04/24/18 19:41	75-01-4	
Xylene (Total)	ND	ug/kg	269	1	04/24/18 10:23	04/24/18 19:41	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%.	75-125	1	04/24/18 10:23	04/24/18 19:41	17060-07-0	
Toluene-d8 (S)	95	%.	75-125	1	04/24/18 10:23	04/24/18 19:41	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	04/24/18 10:23	04/24/18 19:41	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	66.9	20	04/23/18 11:09	04/24/18 13:02	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	38.5	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.67	mg/kg	0.52	1	04/20/18 10:25	04/20/18 14:01	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.4	mg/kg	1.0	1	04/18/18 14:45	04/19/18 16:34	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: **FD-TT-07 (6-11 WM)** Lab ID: **10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.2	1	04/25/18 10:56	04/27/18 16:54	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	309-00-2	
alpha-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	319-84-6	
beta-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	319-85-7	
delta-BHC	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	58-89-9	
Chlordane (Technical)	ND	ug/kg	116	5	04/16/18 10:57	04/20/18 04:41	57-74-9	
alpha-Chlordane	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	5103-71-9	
gamma-Chlordane	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	5103-74-2	
4,4'-DDD	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	72-54-8	
4,4'-DDE	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	72-55-9	
4,4'-DDT	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	50-29-3	
Dieldrin	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	60-57-1	
Endosulfan I	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	959-98-8	
Endosulfan II	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	33213-65-9	
Endosulfan sulfate	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	1031-07-8	
Endrin	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	72-20-8	
Endrin aldehyde	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	7421-93-4	
Endrin ketone	ND	ug/kg	23.0	5	04/16/18 10:57	04/20/18 04:41	53494-70-5	
Heptachlor	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.6	5	04/16/18 10:57	04/20/18 04:41	1024-57-3	
Methoxychlor	ND	ug/kg	116	5	04/16/18 10:57	04/20/18 04:41	72-43-5	
Toxaphene	ND	ug/kg	346	5	04/16/18 10:57	04/20/18 04:41	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	96	%	30-150	5	04/16/18 10:57	04/20/18 04:41	877-09-8	4M, D3
Decachlorobiphenyl (S)	100	%	30-150	5	04/16/18 10:57	04/20/18 04:41	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11141-16-5	
PCB-1242 (Aroclor 1242)	3430	ug/kg	229	5	04/13/18 19:35	04/17/18 09:17	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	12672-29-6	
PCB-1254 (Aroclor 1254)	355	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.8	1	04/13/18 19:35	04/16/18 19:42	11100-14-4	
PCB, Total	3780	ug/kg	229	5	04/13/18 19:35	04/17/18 09:17	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	79	%	48-125	1	04/13/18 19:35	04/16/18 19:42	877-09-8	
Decachlorobiphenyl (S)	71	%	30-134	1	04/13/18 19:35	04/16/18 19:42	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	497	mg/kg	54.9	5	04/16/18 14:24	04/20/18 09:20		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	160	%	50-150	5	04/16/18 14:24	04/20/18 09:20	638-68-6	S5
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.3	1	04/24/18 13:27	04/25/18 01:57		
Surrogates								
a,a,a-Trifluorotoluene (S)	97	%	80-150	1	04/24/18 13:27	04/25/18 01:57	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7160	mg/kg	13.0	1	04/18/18 09:37	04/21/18 19:49	7429-90-5	
Barium	144	mg/kg	0.65	1	04/18/18 09:37	04/21/18 19:49	7440-39-3	
Boron	95.1	mg/kg	9.7	1	04/18/18 09:37	04/21/18 19:49	7440-42-8	
Copper	507	mg/kg	0.65	1	04/18/18 09:37	04/21/18 19:49	7440-50-8	
Iron	61000	mg/kg	32.4	10	04/18/18 09:37	04/24/18 18:47	7439-89-6	
Manganese	447	mg/kg	0.32	1	04/18/18 09:37	04/21/18 19:49	7439-96-5	
Nickel	45.5	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:49	7440-02-0	
Silver	1.0	mg/kg	0.65	1	04/18/18 09:37	04/21/18 19:49	7440-22-4	
Tin	83.4	mg/kg	4.9	1	04/18/18 09:37	04/21/18 19:49	7440-31-5	
Titanium	312	mg/kg	1.6	1	04/18/18 09:37	04/21/18 19:49	7440-32-6	
Zinc	553	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:49	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	54.4	mg/kg	1.3	5	04/20/18 09:20	04/21/18 02:02	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.9	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7440-36-0	
Arsenic	12.6	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7440-38-2	
Beryllium	1.3	mg/kg	0.26	20	04/16/18 08:41	04/16/18 15:53	7440-41-7	
Cadmium	2.7	mg/kg	0.11	20	04/16/18 08:41	04/16/18 15:53	7440-43-9	
Cobalt	8.4	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7440-48-4	
Lead	338	mg/kg	0.13	20	04/16/18 08:41	04/16/18 15:53	7439-92-1	
Lithium	9.4	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7439-93-2	
Selenium	2.4	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7782-49-2	
Strontium	124	mg/kg	0.66	20	04/16/18 08:41	04/16/18 15:53	7440-24-6	
Vanadium	41.4	mg/kg	1.3	20	04/16/18 08:41	04/16/18 15:53	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	1.0	mg/kg	0.024	1	04/18/18 09:38	04/19/18 18:29	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	28.0	%	0.10	1		04/19/18 15:13		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	83-32-9	
Acenaphthylene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	120-12-7	
Benzo(a)anthracene	667	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	56-55-3	
Benzo(a)pyrene	667	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	50-32-8	
Benzo(b)fluoranthene	895	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	205-99-2	
Benzo(g,h,i)perylene	459	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	101-55-3	
Butylbenzylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	85-68-7	
Carbazole	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	59-50-7	
4-Chloroaniline	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	108-60-1	
2-Chloronaphthalene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	91-58-7	
2-Chlorophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	7005-72-3	
Chrysene	715	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	53-70-3	
Dibenzofuran	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	120-83-2	
Diethylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	105-67-9	
Dimethylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	131-11-3	
Di-n-butylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2360	1	04/13/18 17:55	04/19/18 22:04	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	606-20-2	
Di-n-octylphthalate	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	122-66-7	
bis(2-Ethylhexyl)phthalate	5580	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	117-81-7	
Fluoranthene	996	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	206-44-0	
Fluorene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	87-68-3	
Hexachlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	118-74-1	
Hexachloroethane	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	193-39-5	
Isophorone	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	78-59-1	
1-Methylnaphthalene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	90-12-0	
2-Methylnaphthalene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	916	1	04/13/18 17:55	04/19/18 22:04		
Naphthalene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	91-20-3	
2-Nitroaniline	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	88-74-4	
3-Nitroaniline	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	99-09-2	
4-Nitroaniline	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	100-01-6	
Nitrobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	98-95-3	
2-Nitrophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	88-75-5	
4-Nitrophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	86-30-6	
Pentachlorophenol	ND	ug/kg	930	1	04/13/18 17:55	04/19/18 22:04	87-86-5	
Phenanthrene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	85-01-8	
Phenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	108-95-2	
Pyrene	955	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	458	1	04/13/18 17:55	04/19/18 22:04	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/13/18 17:55	04/19/18 22:04	4165-60-0	
2-Fluorobiphenyl (S)	63	%.	30-132	1	04/13/18 17:55	04/19/18 22:04	321-60-8	
p-Terphenyl-d14 (S)	78	%.	62-125	1	04/13/18 17:55	04/19/18 22:04	1718-51-0	
Phenol-d6 (S)	61	%.	48-125	1	04/13/18 17:55	04/19/18 22:04	13127-88-3	
2-Fluorophenol (S)	60	%.	40-125	1	04/13/18 17:55	04/19/18 22:04	367-12-4	
2,4,6-Tribromophenol (S)	66	%.	60-125	1	04/13/18 17:55	04/19/18 22:04	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	55.3	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	83-32-9	
Acenaphthylene	ND	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	208-96-8	
Anthracene	274	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	120-12-7	
Benzo(a)anthracene	1150	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	56-55-3	
Benzo(a)pyrene	1150	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	50-32-8	
Benzo(b)fluoranthene	1540	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	205-99-2	
Benzo(g,h,i)perylene	561	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	191-24-2	
Benzo(k)fluoranthene	602	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	207-08-9	
Chrysene	1150	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	218-01-9	
Dibenz(a,h)anthracene	200	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	53-70-3	
Fluoranthene	2240	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	206-44-0	
Fluorene	65.4	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	86-73-7	
Indeno(1,2,3-cd)pyrene	620	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	193-39-5	
Naphthalene	ND	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	91-20-3	
Phenanthrene	790	ug/kg	27.7	2	04/13/18 17:54	04/17/18 15:59	85-01-8	
Pyrene	1810	ug/kg	139	10	04/13/18 17:54	04/18/18 13:15	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	87	%.	42-125	2	04/13/18 17:54	04/17/18 15:59	321-60-8	D3
p-Terphenyl-d14 (S)	96	%.	57-125	2	04/13/18 17:54	04/17/18 15:59	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1750	1	04/24/18 10:23	04/24/18 19:58	67-64-1	
Allyl chloride	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	107-05-1	
Benzene	ND	ug/kg	35.0	1	04/24/18 10:23	04/24/18 19:58	71-43-2	
Bromobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	108-86-1	
Bromochloromethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	74-97-5	
Bromodichloromethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-27-4	
Bromoform	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-25-2	
Bromomethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	74-83-9	
2-Butanone (MEK)	ND	ug/kg	437	1	04/24/18 10:23	04/24/18 19:58	78-93-3	
n-Butylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	104-51-8	
sec-Butylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	135-98-8	
tert-Butylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	98-06-6	
Carbon tetrachloride	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	56-23-5	
Chlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	108-90-7	
Chloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-00-3	
Chloroform	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	67-66-3	
Chloromethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	74-87-3	
2-Chlorotoluene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	95-49-8	
4-Chlorotoluene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	96-12-8	
Dibromochloromethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	106-93-4	
Dibromomethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	75-71-8	
1,1-Dichloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-34-3	
1,2-Dichloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	107-06-2	
1,1-Dichloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	156-60-5	
Dichlorofluoromethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	75-43-4	
1,2-Dichloropropane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	78-87-5	
1,3-Dichloropropane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	142-28-9	
2,2-Dichloropropane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	594-20-7	
1,1-Dichloropropene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	60-29-7	
Ethylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	437	1	04/24/18 10:23	04/24/18 19:58	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	98-82-8	
p-Isopropyltoluene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	99-87-6	
Methylene Chloride	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	437	1	04/24/18 10:23	04/24/18 19:58	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-07 (6-11 WM) **Lab ID: 10427291005** Collected: 04/12/18 13:00 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	1634-04-4	
Naphthalene	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	91-20-3	
n-Propylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	103-65-1	
Styrene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	79-34-5	
Tetrachloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	127-18-4	
Tetrahydrofuran	ND	ug/kg	3500	1	04/24/18 10:23	04/24/18 19:58	109-99-9	
Toluene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	79-00-5	
Trichloroethene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	79-01-6	
Trichlorofluoromethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	350	1	04/24/18 10:23	04/24/18 19:58	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	87.4	1	04/24/18 10:23	04/24/18 19:58	108-67-8	
Vinyl chloride	ND	ug/kg	35.0	1	04/24/18 10:23	04/24/18 19:58	75-01-4	
Xylene (Total)	ND	ug/kg	262	1	04/24/18 10:23	04/24/18 19:58	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 19:58	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	04/24/18 10:23	04/24/18 19:58	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	04/24/18 10:23	04/24/18 19:58	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	54.0	20	04/23/18 11:09	04/24/18 13:03	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	54.4	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.85	mg/kg	0.45	1	04/25/18 11:00	04/25/18 13:19	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/18/18 14:45	04/19/18 22:26	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.5	1	04/25/18 10:56	04/27/18 17:00	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	309-00-2	
alpha-BHC	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	319-84-6	
beta-BHC	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	319-85-7	
delta-BHC	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	58-89-9	
Chlordane (Technical)	ND	ug/kg	107	5	04/16/18 10:57	04/20/18 04:59	57-74-9	
alpha-Chlordane	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	5103-71-9	
gamma-Chlordane	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	5103-74-2	
4,4'-DDD	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	72-54-8	
4,4'-DDE	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	72-55-9	
4,4'-DDT	22.9	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	50-29-3	
Dieldrin	29.7	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	60-57-1	
Endosulfan I	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	959-98-8	
Endosulfan II	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	33213-65-9	
Endosulfan sulfate	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	1031-07-8	
Endrin	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	72-20-8	
Endrin aldehyde	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	7421-93-4	
Endrin ketone	ND	ug/kg	21.3	5	04/16/18 10:57	04/20/18 04:59	53494-70-5	
Heptachlor	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	76-44-8	
Heptachlor epoxide	ND	ug/kg	10.7	5	04/16/18 10:57	04/20/18 04:59	1024-57-3	
Methoxychlor	ND	ug/kg	107	5	04/16/18 10:57	04/20/18 04:59	72-43-5	
Toxaphene	ND	ug/kg	319	5	04/16/18 10:57	04/20/18 04:59	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	89	%	30-150	5	04/16/18 10:57	04/20/18 04:59	877-09-8	4M, D4
Decachlorobiphenyl (S)	84	%	30-150	5	04/16/18 10:57	04/20/18 04:59	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11141-16-5	
PCB-1242 (Aroclor 1242)	2380	ug/kg	84.4	2	04/13/18 19:35	04/17/18 09:32	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	12672-29-6	
PCB-1254 (Aroclor 1254)	504	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.2	1	04/13/18 19:35	04/16/18 19:58	11100-14-4	
PCB, Total	2880	ug/kg	84.4	2	04/13/18 19:35	04/17/18 09:32	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	74	%	48-125	1	04/13/18 19:35	04/16/18 19:58	877-09-8	
Decachlorobiphenyl (S)	74	%	30-134	1	04/13/18 19:35	04/16/18 19:58	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	825	mg/kg	136	10	04/16/18 14:24	04/20/18 09:27		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/16/18 14:24	04/20/18 09:27	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.6	1	04/24/18 13:27	04/25/18 02:21		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/24/18 13:27	04/25/18 02:21	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9940	mg/kg	12.4	1	04/18/18 09:37	04/21/18 19:53	7429-90-5	
Barium	156	mg/kg	0.62	1	04/18/18 09:37	04/21/18 19:53	7440-39-3	
Boron	138	mg/kg	9.3	1	04/18/18 09:37	04/21/18 19:53	7440-42-8	
Copper	193	mg/kg	0.62	1	04/18/18 09:37	04/21/18 19:53	7440-50-8	
Iron	53400	mg/kg	31.0	10	04/18/18 09:37	04/24/18 18:50	7439-89-6	
Manganese	382	mg/kg	0.31	1	04/18/18 09:37	04/21/18 19:53	7439-96-5	
Nickel	41.1	mg/kg	1.2	1	04/18/18 09:37	04/21/18 19:53	7440-02-0	
Silver	ND	mg/kg	0.62	1	04/18/18 09:37	04/21/18 19:53	7440-22-4	
Tin	50.1	mg/kg	4.7	1	04/18/18 09:37	04/21/18 19:53	7440-31-5	
Titanium	327	mg/kg	1.6	1	04/18/18 09:37	04/21/18 19:53	7440-32-6	
Zinc	365	mg/kg	1.2	1	04/18/18 09:37	04/21/18 19:53	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	109	mg/kg	1.3	5	04/20/18 09:20	04/21/18 02:07	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.6	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7440-36-0	
Arsenic	37.0	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7440-38-2	
Beryllium	1.6	mg/kg	0.24	20	04/16/18 08:41	04/16/18 15:46	7440-41-7	
Cadmium	13.7	mg/kg	0.097	20	04/16/18 08:41	04/16/18 15:46	7440-43-9	
Cobalt	8.5	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7440-48-4	
Lead	558	mg/kg	0.61	100	04/16/18 08:41	04/17/18 12:38	7439-92-1	
Lithium	7.8	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7439-93-2	
Selenium	4.5	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7782-49-2	
Strontium	69.9	mg/kg	0.61	20	04/16/18 08:41	04/16/18 15:46	7440-24-6	
Vanadium	96.5	mg/kg	1.2	20	04/16/18 08:41	04/16/18 15:46	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.26	mg/kg	0.024	1	04/18/18 09:38	04/19/18 18:31	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	21.8	%	0.10	1		04/19/18 15:13		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	83-32-9	
Acenaphthylene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	120-12-7	
Benzo(a)anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	56-55-3	
Benzo(a)pyrene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	101-55-3	
Butylbenzylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	85-68-7	
Carbazole	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	59-50-7	
4-Chloroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	108-60-1	
2-Chloronaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	91-58-7	
2-Chlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	7005-72-3	
Chrysene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	53-70-3	
Dibenzofuran	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	120-83-2	
Diethylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	105-67-9	
Dimethylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	131-11-3	
Di-n-butylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2170	1	04/13/18 17:55	04/19/18 18:46	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	606-20-2	
Di-n-octylphthalate	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	122-66-7	
bis(2-Ethylhexyl)phthalate	1020	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	117-81-7	
Fluoranthene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	206-44-0	
Fluorene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	87-68-3	
Hexachlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	118-74-1	
Hexachloroethane	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	193-39-5	
Isophorone	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	78-59-1	
1-Methylnaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	90-12-0	
2-Methylnaphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	841	1	04/13/18 17:55	04/19/18 18:46		
Naphthalene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	91-20-3	
2-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	88-74-4	
3-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	99-09-2	
4-Nitroaniline	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	100-01-6	
Nitrobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	98-95-3	
2-Nitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	88-75-5	
4-Nitrophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	86-30-6	
Pentachlorophenol	ND	ug/kg	853	1	04/13/18 17:55	04/19/18 18:46	87-86-5	
Phenanthrene	479	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	85-01-8	
Phenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	108-95-2	
Pyrene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	420	1	04/13/18 17:55	04/19/18 18:46	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	56	%.	43-125	1	04/13/18 17:55	04/19/18 18:46	4165-60-0	
2-Fluorobiphenyl (S)	74	%.	30-132	1	04/13/18 17:55	04/19/18 18:46	321-60-8	
p-Terphenyl-d14 (S)	85	%.	62-125	1	04/13/18 17:55	04/19/18 18:46	1718-51-0	
Phenol-d6 (S)	64	%.	48-125	1	04/13/18 17:55	04/19/18 18:46	13127-88-3	
2-Fluorophenol (S)	54	%.	40-125	1	04/13/18 17:55	04/19/18 18:46	367-12-4	
2,4,6-Tribromophenol (S)	83	%.	60-125	1	04/13/18 17:55	04/19/18 18:46	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	83-32-9	
Acenaphthylene	ND	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	208-96-8	
Anthracene	65.2	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	120-12-7	
Benzo(a)anthracene	220	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	56-55-3	
Benzo(a)pyrene	185	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	50-32-8	
Benzo(b)fluoranthene	297	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	205-99-2	
Benzo(g,h,i)perylene	123	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	191-24-2	
Benzo(k)fluoranthene	98.6	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	207-08-9	
Chrysene	352	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	53-70-3	
Fluoranthene	365	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	206-44-0	
Fluorene	118	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	86-73-7	
Indeno(1,2,3-cd)pyrene	89.4	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	193-39-5	
Naphthalene	76.3	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	91-20-3	
Phenanthrene	506	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	85-01-8	
Pyrene	399	ug/kg	63.8	5	04/18/18 17:23	04/20/18 15:23	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%.	42-125	5	04/18/18 17:23	04/20/18 15:23	321-60-8	
p-Terphenyl-d14 (S)	100	%.	57-125	5	04/18/18 17:23	04/20/18 15:23	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1730	1	04/24/18 10:23	04/24/18 20:15	67-64-1	
Allyl chloride	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	107-05-1	
Benzene	818	ug/kg	34.5	1	04/24/18 10:23	04/24/18 20:15	71-43-2	
Bromobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	108-86-1	
Bromochloromethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	74-97-5	
Bromodichloromethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	75-27-4	
Bromoform	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	75-25-2	
Bromomethane	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	74-83-9	
2-Butanone (MEK)	ND	ug/kg	432	1	04/24/18 10:23	04/24/18 20:15	78-93-3	
n-Butylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	98-06-6	
Carbon tetrachloride	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	56-23-5	
Chlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	108-90-7	
Chloroethane	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	75-00-3	
Chloroform	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	67-66-3	
Chloromethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	96-12-8	
Dibromochloromethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	106-93-4	
Dibromomethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	75-71-8	
1,1-Dichloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	107-06-2	
1,1-Dichloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	156-60-5	
Dichlorofluoromethane	ND	ug/kg	863	1	04/24/18 10:23	04/24/18 20:15	75-43-4	
1,2-Dichloropropane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	60-29-7	
Ethylbenzene	510	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	432	1	04/24/18 10:23	04/24/18 20:15	87-68-3	
Isopropylbenzene (Cumene)	114	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	98-82-8	
p-Isopropyltoluene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	99-87-6	
Methylene Chloride	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	432	1	04/24/18 10:23	04/24/18 20:15	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: FD-TT-08 (5-12 WM) **Lab ID: 10427291006** Collected: 04/12/18 14:30 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	1634-04-4	
Naphthalene	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	91-20-3	
n-Propylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	103-65-1	
Styrene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	79-34-5	
Tetrachloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	127-18-4	
Tetrahydrofuran	ND	ug/kg	3450	1	04/24/18 10:23	04/24/18 20:15	109-99-9	
Toluene	717	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	79-00-5	
Trichloroethene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	79-01-6	
Trichlorofluoromethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	345	1	04/24/18 10:23	04/24/18 20:15	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	86.3	1	04/24/18 10:23	04/24/18 20:15	108-67-8	
Vinyl chloride	ND	ug/kg	34.5	1	04/24/18 10:23	04/24/18 20:15	75-01-4	
Xylene (Total)	386	ug/kg	259	1	04/24/18 10:23	04/24/18 20:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%.	75-125	1	04/24/18 10:23	04/24/18 20:15	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 20:15	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125	1	04/24/18 10:23	04/24/18 20:15	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	50.4	20	04/23/18 11:09	04/24/18 13:03	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	109	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.39	1	04/25/18 11:00	04/25/18 13:20	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.3	mg/kg	1.0	1	04/18/18 14:45	04/19/18 21:27	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.6	1	04/25/18 10:56	04/27/18 17:07	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	309-00-2	
alpha-BHC	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	319-84-6	
beta-BHC	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	319-85-7	
delta-BHC	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	58-89-9	
Chlordane (Technical)	ND	ug/kg	1860	100	04/16/18 10:57	04/20/18 09:52	57-74-9	
alpha-Chlordane	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	5103-71-9	
gamma-Chlordane	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	5103-74-2	
4,4'-DDD	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	72-54-8	
4,4'-DDE	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	72-55-9	
4,4'-DDT	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	50-29-3	
Dieldrin	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	60-57-1	
Endosulfan I	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	959-98-8	
Endosulfan II	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	33213-65-9	
Endosulfan sulfate	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	1031-07-8	
Endrin	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	72-20-8	
Endrin aldehyde	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	7421-93-4	
Endrin ketone	ND	ug/kg	371	100	04/16/18 10:57	04/20/18 09:52	53494-70-5	
Heptachlor	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	76-44-8	
Heptachlor epoxide	ND	ug/kg	186	100	04/16/18 10:57	04/20/18 09:52	1024-57-3	
Methoxychlor	ND	ug/kg	1860	100	04/16/18 10:57	04/20/18 09:52	72-43-5	
Toxaphene	ND	ug/kg	5570	100	04/16/18 10:57	04/20/18 09:52	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	100	04/16/18 10:57	04/20/18 09:52	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	100	04/16/18 10:57	04/20/18 09:52	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	11100-14-4	
PCB, Total	ND	ug/kg	36.8	1	04/13/18 19:35	04/16/18 20:14	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	67	%.	48-125	1	04/13/18 19:35	04/16/18 20:14	877-09-8	
Decachlorobiphenyl (S)	67	%.	30-134	1	04/13/18 19:35	04/16/18 20:14	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1480	mg/kg	930	20	04/16/18 14:24	04/19/18 17:51		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/16/18 14:24	04/19/18 17:51	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	53.6	mg/kg	13.0	1	04/24/18 13:27	04/25/18 02:45		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/24/18 13:27	04/25/18 02:45	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3840	mg/kg	10.6	1	04/18/18 09:37	04/21/18 19:57	7429-90-5	
Barium	75.4	mg/kg	0.53	1	04/18/18 09:37	04/21/18 19:57	7440-39-3	
Boron	12.2	mg/kg	8.0	1	04/18/18 09:37	04/21/18 19:57	7440-42-8	
Copper	11.3	mg/kg	0.53	1	04/18/18 09:37	04/21/18 19:57	7440-50-8	
Iron	12500	mg/kg	13.3	5	04/18/18 09:37	04/24/18 18:53	7439-89-6	
Manganese	455	mg/kg	0.27	1	04/18/18 09:37	04/21/18 19:57	7439-96-5	
Nickel	10.8	mg/kg	1.1	1	04/18/18 09:37	04/21/18 19:57	7440-02-0	
Silver	ND	mg/kg	0.53	1	04/18/18 09:37	04/21/18 19:57	7440-22-4	
Tin	ND	mg/kg	4.0	1	04/18/18 09:37	04/21/18 19:57	7440-31-5	
Titanium	186	mg/kg	1.3	1	04/18/18 09:37	04/21/18 19:57	7440-32-6	
Zinc	65.9	mg/kg	1.1	1	04/18/18 09:37	04/21/18 19:57	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	14.0	mg/kg	1.0	5	04/20/18 09:20	04/21/18 02:20	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7440-36-0	
Arsenic	2.7	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7440-38-2	
Beryllium	0.25	mg/kg	0.21	20	04/16/18 08:41	04/16/18 15:50	7440-41-7	
Cadmium	0.26	mg/kg	0.083	20	04/16/18 08:41	04/16/18 15:50	7440-43-9	
Cobalt	4.3	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7440-48-4	
Lead	43.4	mg/kg	0.10	20	04/16/18 08:41	04/16/18 15:50	7439-92-1	
Lithium	4.4	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7439-93-2	
Selenium	ND	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7782-49-2	
Strontium	19.8	mg/kg	0.52	20	04/16/18 08:41	04/16/18 15:50	7440-24-6	
Vanadium	19.1	mg/kg	1.0	20	04/16/18 08:41	04/16/18 15:50	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.044	mg/kg	0.020	1	04/18/18 09:38	04/19/18 18:35	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	10.4	%	0.10	1		04/19/18 15:13		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	208-96-8	
Anthracene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	120-12-7	
Benzo(a)anthracene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	56-55-3	
Benzo(a)pyrene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	101-55-3	
Butylbenzylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	85-68-7	
Carbazole	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	59-50-7	
4-Chloroaniline	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	108-60-1	
2-Chloronaphthalene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	91-58-7	
2-Chlorophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	7005-72-3	
Chrysene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	53-70-3	
Dibenzofuran	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	120-83-2	
Diethylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	105-67-9	
Dimethylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	131-11-3	
Di-n-butylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	18900	1	04/13/18 17:55	04/19/18 22:32	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	606-20-2	
Di-n-octylphthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	117-81-7	
Fluoranthene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	206-44-0	
Fluorene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	87-68-3	
Hexachlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	118-74-1	
Hexachloroethane	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	193-39-5	
Isophorone	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	78-59-1	
1-Methylnaphthalene	5860	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	90-12-0	
2-Methylnaphthalene	8050	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	7340	1	04/13/18 17:55	04/19/18 22:32		
Naphthalene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	91-20-3	
2-Nitroaniline	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	88-74-4	
3-Nitroaniline	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	99-09-2	
4-Nitroaniline	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	100-01-6	
Nitrobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	98-95-3	
2-Nitrophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	88-75-5	
4-Nitrophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	86-30-6	
Pentachlorophenol	ND	ug/kg	7450	1	04/13/18 17:55	04/19/18 22:32	87-86-5	
Phenanthrene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	85-01-8	
Phenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	108-95-2	
Pyrene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	3670	1	04/13/18 17:55	04/19/18 22:32	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	1	04/13/18 17:55	04/19/18 22:32	4165-60-0	P3,S5
2-Fluorobiphenyl (S)	0	%	30-132	1	04/13/18 17:55	04/19/18 22:32	321-60-8	S5
p-Terphenyl-d14 (S)	0	%	62-125	1	04/13/18 17:55	04/19/18 22:32	1718-51-0	S5
Phenol-d6 (S)	0	%	48-125	1	04/13/18 17:55	04/19/18 22:32	13127-88-3	S5
2-Fluorophenol (S)	0	%	40-125	1	04/13/18 17:55	04/19/18 22:32	367-12-4	S5
2,4,6-Tribromophenol (S)	0	%	60-125	1	04/13/18 17:55	04/19/18 22:32	118-79-6	S5
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	83-32-9	
Acenaphthylene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	208-96-8	
Anthracene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	120-12-7	
Benzo(a)anthracene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	56-55-3	
Benzo(a)pyrene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	207-08-9	
Chrysene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	53-70-3	
Fluoranthene	714	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	206-44-0	
Fluorene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	193-39-5	
Naphthalene	ND	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	91-20-3	
Phenanthrene	1340	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	85-01-8	
Pyrene	1310	ug/kg	558	5	04/13/18 17:54	04/16/18 23:00	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
2-Fluorobiphenyl (S)	0	%.	42-125	5	04/13/18 17:54	04/16/18 23:00	321-60-8	D3,P3, S4
p-Terphenyl-d14 (S)	0	%.	57-125	5	04/13/18 17:54	04/16/18 23:00	1718-51-0	S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1150	1	04/24/18 10:23	04/24/18 20:32	67-64-1	
Allyl chloride	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	107-05-1	
Benzene	ND	ug/kg	22.9	1	04/24/18 10:23	04/24/18 20:32	71-43-2	
Bromobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	108-86-1	
Bromochloromethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	74-97-5	
Bromodichloromethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	75-27-4	
Bromoform	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	75-25-2	
Bromomethane	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	74-83-9	
2-Butanone (MEK)	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 20:32	78-93-3	
n-Butylbenzene	76.6	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	104-51-8	
sec-Butylbenzene	60.0	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	135-98-8	
tert-Butylbenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	98-06-6	
Carbon tetrachloride	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	56-23-5	
Chlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	108-90-7	
Chloroethane	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	75-00-3	
Chloroform	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	67-66-3	
Chloromethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	74-87-3	
2-Chlorotoluene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	95-49-8	
4-Chlorotoluene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	96-12-8	
Dibromochloromethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	106-93-4	
Dibromomethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	75-71-8	
1,1-Dichloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	75-34-3	
1,2-Dichloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	107-06-2	
1,1-Dichloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	156-60-5	
Dichlorofluoromethane	ND	ug/kg	573	1	04/24/18 10:23	04/24/18 20:32	75-43-4	
1,2-Dichloropropane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	78-87-5	
1,3-Dichloropropane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	142-28-9	
2,2-Dichloropropane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	594-20-7	
1,1-Dichloropropene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	60-29-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-01 (5-8 WM) **Lab ID: 10427291007** Collected: 04/12/18 17:20 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Ethylbenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 20:32	87-68-3	
Isopropylbenzene (Cumene)	72.1	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	98-82-8	
p-Isopropyltoluene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	99-87-6	
Methylene Chloride	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	287	1	04/24/18 10:23	04/24/18 20:32	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	1634-04-4	
Naphthalene	1320	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	91-20-3	
n-Propylbenzene	134	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	103-65-1	
Styrene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	79-34-5	
Tetrachloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	127-18-4	
Tetrahydrofuran	ND	ug/kg	2290	1	04/24/18 10:23	04/24/18 20:32	109-99-9	
Toluene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	79-00-5	
Trichloroethene	ND	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	79-01-6	
Trichlorofluoromethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	229	1	04/24/18 10:23	04/24/18 20:32	76-13-1	
1,2,4-Trimethylbenzene	327	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	95-63-6	
1,3,5-Trimethylbenzene	137	ug/kg	57.3	1	04/24/18 10:23	04/24/18 20:32	108-67-8	
Vinyl chloride	ND	ug/kg	22.9	1	04/24/18 10:23	04/24/18 20:32	75-01-4	
Xylene (Total)	208	ug/kg	172	1	04/24/18 10:23	04/24/18 20:32	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/24/18 10:23	04/24/18 20:32	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/24/18 10:23	04/24/18 20:32	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	04/24/18 10:23	04/24/18 20:32	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	44.5	20	04/23/18 11:09	04/24/18 13:03	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	14.0	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.24	1	04/25/18 11:00	04/25/18 13:21	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.1	mg/kg	1.0	1	04/18/18 14:45	04/19/18 18:50	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	8.81	1	04/25/18 10:56	04/27/18 17:14	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	309-00-2	
alpha-BHC	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	319-84-6	
beta-BHC	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	319-85-7	
delta-BHC	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	58-89-9	
Chlordane (Technical)	ND	ug/kg	36.0	2	04/16/18 10:57	04/20/18 01:38	57-74-9	
alpha-Chlordane	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	5103-71-9	
gamma-Chlordane	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	5103-74-2	
4,4'-DDD	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	72-54-8	
4,4'-DDE	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	72-55-9	
4,4'-DDT	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	50-29-3	
Dieldrin	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	60-57-1	
Endosulfan I	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	959-98-8	
Endosulfan II	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	33213-65-9	
Endosulfan sulfate	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	1031-07-8	
Endrin	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	72-20-8	
Endrin aldehyde	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	7421-93-4	
Endrin ketone	ND	ug/kg	7.2	2	04/16/18 10:57	04/20/18 01:38	53494-70-5	
Heptachlor	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	76-44-8	
Heptachlor epoxide	ND	ug/kg	3.6	2	04/16/18 10:57	04/20/18 01:38	1024-57-3	
Methoxychlor	ND	ug/kg	36.0	2	04/16/18 10:57	04/20/18 01:38	72-43-5	
Toxaphene	ND	ug/kg	108	2	04/16/18 10:57	04/20/18 01:38	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	87	%	30-150	2	04/16/18 10:57	04/20/18 01:38	877-09-8	5M, D3
Decachlorobiphenyl (S)	85	%	30-150	2	04/16/18 10:57	04/20/18 01:38	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	11100-14-4	
PCB, Total	ND	ug/kg	35.7	1	04/13/18 19:35	04/16/18 20:30	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	91	%	48-125	1	04/13/18 19:35	04/16/18 20:30	877-09-8	
Decachlorobiphenyl (S)	79	%	30-134	1	04/13/18 19:35	04/16/18 20:30	2051-24-3	
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	12.4	mg/kg	9.3	1	04/16/18 14:24	04/19/18 19:38		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
<i>Surrogates</i>								
n-Triacontane (S)	87	%	50-150	1	04/16/18 14:24	04/19/18 19:38	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.9	1	04/24/18 13:27	04/25/18 03:08		
<i>Surrogates</i>								
a,a,a-Trifluorotoluene (S)	100	%	80-150	1	04/24/18 13:27	04/25/18 03:08	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	2940	mg/kg	10.7	1	04/18/18 09:37	04/21/18 20:01	7429-90-5	
Barium	49.5	mg/kg	0.54	1	04/18/18 09:37	04/21/18 20:01	7440-39-3	
Boron	ND	mg/kg	8.0	1	04/18/18 09:37	04/21/18 20:01	7440-42-8	
Copper	6.5	mg/kg	0.54	1	04/18/18 09:37	04/21/18 20:01	7440-50-8	
Iron	7500	mg/kg	2.7	1	04/18/18 09:37	04/21/18 20:01	7439-89-6	
Manganese	258	mg/kg	0.27	1	04/18/18 09:37	04/21/18 20:01	7439-96-5	
Nickel	8.7	mg/kg	1.1	1	04/18/18 09:37	04/21/18 20:01	7440-02-0	
Silver	ND	mg/kg	0.54	1	04/18/18 09:37	04/21/18 20:01	7440-22-4	
Tin	ND	mg/kg	4.0	1	04/18/18 09:37	04/21/18 20:01	7440-31-5	
Titanium	204	mg/kg	1.3	1	04/18/18 09:37	04/21/18 20:01	7440-32-6	
Zinc	26.9	mg/kg	1.1	1	04/18/18 09:37	04/21/18 20:01	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	8.8	mg/kg	0.98	5	04/20/18 09:20	04/21/18 02:25	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7440-36-0	
Arsenic	2.9	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7440-38-2	
Beryllium	ND	mg/kg	0.21	20	04/16/18 08:41	04/16/18 14:33	7440-41-7	
Cadmium	0.10	mg/kg	0.086	20	04/16/18 08:41	04/16/18 14:33	7440-43-9	
Cobalt	3.3	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7440-48-4	
Lead	4.5	mg/kg	0.11	20	04/16/18 08:41	04/16/18 14:33	7439-92-1	
Lithium	4.4	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7439-93-2	
Selenium	ND	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7782-49-2	
Strontium	25.0	mg/kg	0.54	20	04/16/18 08:41	04/16/18 14:33	7440-24-6	
Vanadium	16.3	mg/kg	1.1	20	04/16/18 08:41	04/16/18 14:33	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.021	1	04/18/18 09:38	04/19/18 18:38	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	7.6	%	0.10	1		04/19/18 15:14		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	83-32-9	
Acenaphthylene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Anthracene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	120-12-7	
Benzo(a)anthracene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	56-55-3	
Benzo(a)pyrene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	101-55-3	
Butylbenzylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	85-68-7	
Carbazole	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	59-50-7	
4-Chloroaniline	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	108-60-1	
2-Chloronaphthalene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	91-58-7	
2-Chlorophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	7005-72-3	
Chrysene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	53-70-3	
Dibenzofuran	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	120-83-2	
Diethylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	105-67-9	
Dimethylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	131-11-3	
Di-n-butylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1840	1	04/20/18 12:55	04/24/18 16:26	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	606-20-2	
Di-n-octylphthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	117-81-7	
Fluoranthene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	206-44-0	
Fluorene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	87-68-3	
Hexachlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	118-74-1	
Hexachloroethane	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	193-39-5	
Isophorone	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	78-59-1	
1-Methylnaphthalene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	90-12-0	
2-Methylnaphthalene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	714	1	04/20/18 12:55	04/24/18 16:26		
Naphthalene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	91-20-3	
2-Nitroaniline	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	88-74-4	
3-Nitroaniline	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	99-09-2	
4-Nitroaniline	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	100-01-6	
Nitrobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	98-95-3	
2-Nitrophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	88-75-5	
4-Nitrophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	86-30-6	
Pentachlorophenol	ND	ug/kg	725	1	04/20/18 12:55	04/24/18 16:26	87-86-5	
Phenanthrene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	85-01-8	
Phenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	108-95-2	
Pyrene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	357	1	04/20/18 12:55	04/24/18 16:26	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	49	%.	43-125	1	04/20/18 12:55	04/24/18 16:26	4165-60-0	
2-Fluorobiphenyl (S)	63	%.	30-132	1	04/20/18 12:55	04/24/18 16:26	321-60-8	
p-Terphenyl-d14 (S)	89	%.	62-125	1	04/20/18 12:55	04/24/18 16:26	1718-51-0	
Phenol-d6 (S)	53	%.	48-125	1	04/20/18 12:55	04/24/18 16:26	13127-88-3	
2-Fluorophenol (S)	50	%.	40-125	1	04/20/18 12:55	04/24/18 16:26	367-12-4	
2,4,6-Tribromophenol (S)	78	%.	60-125	1	04/20/18 12:55	04/24/18 16:26	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	11.9	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	83-32-9	
Acenaphthylene	ND	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	208-96-8	
Anthracene	17.8	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	120-12-7	
Benzo(a)anthracene	37.9	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	56-55-3	
Benzo(a)pyrene	36.5	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	50-32-8	
Benzo(b)fluoranthene	46.4	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	205-99-2	
Benzo(g,h,i)perylene	19.0	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	191-24-2	
Benzo(k)fluoranthene	20.5	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	207-08-9	
Chrysene	40.1	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	53-70-3	
Fluoranthene	86.0	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	206-44-0	
Fluorene	ND	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	86-73-7	
Indeno(1,2,3-cd)pyrene	14.7	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	193-39-5	
Naphthalene	ND	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	91-20-3	
Phenanthrene	58.1	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	85-01-8	
Pyrene	67.7	ug/kg	10.8	1	04/13/18 17:54	04/16/18 20:49	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	54	%.	42-125	1	04/13/18 17:54	04/16/18 20:49	321-60-8	
p-Terphenyl-d14 (S)	71	%.	57-125	1	04/13/18 17:54	04/16/18 20:49	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1130	1	04/24/18 10:23	04/24/18 20:49	67-64-1	
Allyl chloride	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	107-05-1	
Benzene	ND	ug/kg	22.5	1	04/24/18 10:23	04/24/18 20:49	71-43-2	
Bromobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	108-86-1	
Bromochloromethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	74-97-5	
Bromodichloromethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	75-27-4	
Bromoform	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	75-25-2	
Bromomethane	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	74-83-9	
2-Butanone (MEK)	ND	ug/kg	281	1	04/24/18 10:23	04/24/18 20:49	78-93-3	
n-Butylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	104-51-8	
sec-Butylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	135-98-8	
tert-Butylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	98-06-6	
Carbon tetrachloride	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	56-23-5	
Chlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	108-90-7	
Chloroethane	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	75-00-3	
Chloroform	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	67-66-3	
Chloromethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	74-87-3	
2-Chlorotoluene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	95-49-8	
4-Chlorotoluene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	96-12-8	
Dibromochloromethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	106-93-4	
Dibromomethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	75-71-8	
1,1-Dichloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	75-34-3	
1,2-Dichloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	107-06-2	
1,1-Dichloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	156-60-5	
Dichlorofluoromethane	ND	ug/kg	563	1	04/24/18 10:23	04/24/18 20:49	75-43-4	
1,2-Dichloropropane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	78-87-5	
1,3-Dichloropropane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	142-28-9	
2,2-Dichloropropane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	594-20-7	
1,1-Dichloropropene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	60-29-7	
Ethylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	281	1	04/24/18 10:23	04/24/18 20:49	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	98-82-8	
p-Isopropyltoluene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	99-87-6	
Methylene Chloride	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	281	1	04/24/18 10:23	04/24/18 20:49	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-02 (5-10 S) **Lab ID: 10427291008** Collected: 04/12/18 19:10 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	1634-04-4	
Naphthalene	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	91-20-3	
n-Propylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	103-65-1	
Styrene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	79-34-5	
Tetrachloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	127-18-4	
Tetrahydrofuran	ND	ug/kg	2250	1	04/24/18 10:23	04/24/18 20:49	109-99-9	
Toluene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	79-00-5	
Trichloroethene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	79-01-6	
Trichlorofluoromethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	225	1	04/24/18 10:23	04/24/18 20:49	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	56.3	1	04/24/18 10:23	04/24/18 20:49	108-67-8	
Vinyl chloride	ND	ug/kg	22.5	1	04/24/18 10:23	04/24/18 20:49	75-01-4	
Xylene (Total)	ND	ug/kg	169	1	04/24/18 10:23	04/24/18 20:49	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	04/24/18 10:23	04/24/18 20:49	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	04/24/18 10:23	04/24/18 20:49	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	04/24/18 10:23	04/24/18 20:49	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	10.6	5	04/23/18 11:09	04/24/18 13:03	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	8.8	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.37	1	04/25/18 11:00	04/25/18 13:25	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/18/18 14:45	04/19/18 20:28	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.41	1	04/25/18 10:56	04/27/18 17:20	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	309-00-2	
alpha-BHC	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	319-84-6	
beta-BHC	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	319-85-7	
delta-BHC	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	58-89-9	
Chlordane (Technical)	ND	ug/kg	190	10	04/16/18 10:57	04/20/18 04:04	57-74-9	
alpha-Chlordane	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	5103-71-9	
gamma-Chlordane	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	5103-74-2	
4,4'-DDD	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	72-54-8	
4,4'-DDE	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	72-55-9	
4,4'-DDT	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	50-29-3	
Dieldrin	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	60-57-1	
Endosulfan I	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	959-98-8	
Endosulfan II	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	33213-65-9	
Endosulfan sulfate	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	1031-07-8	
Endrin	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	72-20-8	
Endrin aldehyde	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	7421-93-4	
Endrin ketone	ND	ug/kg	37.8	10	04/16/18 10:57	04/20/18 04:04	53494-70-5	
Heptachlor	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	76-44-8	
Heptachlor epoxide	ND	ug/kg	19.0	10	04/16/18 10:57	04/20/18 04:04	1024-57-3	
Methoxychlor	ND	ug/kg	190	10	04/16/18 10:57	04/20/18 04:04	72-43-5	
Toxaphene	ND	ug/kg	568	10	04/16/18 10:57	04/20/18 04:04	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	04/16/18 10:57	04/20/18 04:04	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	10	04/16/18 10:57	04/20/18 04:04	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	53469-21-9	
PCB-1248 (Aroclor 1248)	56.3	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	11100-14-4	
PCB, Total	56.3	ug/kg	37.5	1	04/13/18 19:35	04/16/18 20:45	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	73	%	48-125	1	04/13/18 19:35	04/16/18 20:45	877-09-8	
Decachlorobiphenyl (S)	77	%	30-134	1	04/13/18 19:35	04/16/18 20:45	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	674	mg/kg	95.8	10	04/16/18 14:24	04/19/18 18:12		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/16/18 14:24	04/19/18 18:12	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.7	1	04/24/18 13:27	04/25/18 03:32		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/24/18 13:27	04/25/18 03:32	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	3290	mg/kg	10.5	1	04/18/18 09:37	04/21/18 20:05	7429-90-5	
Barium	47.1	mg/kg	0.53	1	04/18/18 09:37	04/21/18 20:05	7440-39-3	
Boron	ND	mg/kg	7.9	1	04/18/18 09:37	04/21/18 20:05	7440-42-8	
Copper	9.1	mg/kg	0.53	1	04/18/18 09:37	04/21/18 20:05	7440-50-8	
Iron	7440	mg/kg	2.6	1	04/18/18 09:37	04/21/18 20:05	7439-89-6	
Manganese	282	mg/kg	0.26	1	04/18/18 09:37	04/21/18 20:05	7439-96-5	
Nickel	9.0	mg/kg	1.1	1	04/18/18 09:37	04/21/18 20:05	7440-02-0	
Silver	ND	mg/kg	0.53	1	04/18/18 09:37	04/21/18 20:05	7440-22-4	
Tin	ND	mg/kg	3.9	1	04/18/18 09:37	04/21/18 20:05	7440-31-5	
Titanium	148	mg/kg	1.3	1	04/18/18 09:37	04/21/18 20:05	7440-32-6	
Zinc	38.6	mg/kg	1.1	1	04/18/18 09:37	04/21/18 20:05	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	9.4	mg/kg	1.1	5	04/20/18 09:20	04/21/18 02:29	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7440-36-0	
Arsenic	2.3	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7440-38-2	
Beryllium	0.28	mg/kg	0.22	20	04/16/18 08:41	04/16/18 14:36	7440-41-7	
Cadmium	0.21	mg/kg	0.087	20	04/16/18 08:41	04/16/18 14:36	7440-43-9	
Cobalt	3.7	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7440-48-4	
Lead	199	mg/kg	0.11	20	04/16/18 08:41	04/16/18 14:36	7439-92-1	
Lithium	5.0	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7439-93-2	
Selenium	ND	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7782-49-2	
Strontium	22.7	mg/kg	0.55	20	04/16/18 08:41	04/16/18 14:36	7440-24-6	
Vanadium	18.3	mg/kg	1.1	20	04/16/18 08:41	04/16/18 14:36	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.034	mg/kg	0.022	1	04/18/18 09:38	04/19/18 18:40	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	12.1	%	0.10	1		04/19/18 15:14		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	1010	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	208-96-8	
Anthracene	2220	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	120-12-7	
Benzo(a)anthracene	2580	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	56-55-3	
Benzo(a)pyrene	2040	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	50-32-8	
Benzo(b)fluoranthene	2440	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	205-99-2	
Benzo(g,h,i)perylene	1160	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	191-24-2	
Benzo(k)fluoranthene	1240	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	101-55-3	
Butylbenzylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	85-68-7	
Carbazole	550	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	59-50-7	
4-Chloroaniline	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	108-60-1	
2-Chloronaphthalene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	91-58-7	
2-Chlorophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	7005-72-3	
Chrysene	2430	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	53-70-3	
Dibenzofuran	1300	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	120-83-2	
Diethylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	105-67-9	
Dimethylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	131-11-3	
Di-n-butylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1930	1	04/13/18 17:55	04/19/18 23:01	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	606-20-2	
Di-n-octylphthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	117-81-7	
Fluoranthene	5120	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	206-44-0	
Fluorene	2040	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	87-68-3	
Hexachlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	118-74-1	
Hexachloroethane	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	67-72-1	
Indeno(1,2,3-cd)pyrene	1040	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	193-39-5	
Isophorone	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	78-59-1	
1-Methylnaphthalene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	90-12-0	
2-Methylnaphthalene	427	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	749	1	04/13/18 17:55	04/19/18 23:01		
Naphthalene	632	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	91-20-3	
2-Nitroaniline	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	88-74-4	
3-Nitroaniline	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	99-09-2	
4-Nitroaniline	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	100-01-6	
Nitrobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	98-95-3	
2-Nitrophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	88-75-5	
4-Nitrophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	86-30-6	
Pentachlorophenol	ND	ug/kg	760	1	04/13/18 17:55	04/19/18 23:01	87-86-5	
Phenanthrene	4900	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	85-01-8	
Phenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	108-95-2	
Pyrene	4820	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	374	1	04/13/18 17:55	04/19/18 23:01	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	56	%	43-125	1	04/13/18 17:55	04/19/18 23:01	4165-60-0	
2-Fluorobiphenyl (S)	59	%	30-132	1	04/13/18 17:55	04/19/18 23:01	321-60-8	
p-Terphenyl-d14 (S)	70	%	62-125	1	04/13/18 17:55	04/19/18 23:01	1718-51-0	
Phenol-d6 (S)	56	%	48-125	1	04/13/18 17:55	04/19/18 23:01	13127-88-3	
2-Fluorophenol (S)	57	%	40-125	1	04/13/18 17:55	04/19/18 23:01	367-12-4	
2,4,6-Tribromophenol (S)	59	%	60-125	1	04/13/18 17:55	04/19/18 23:01	118-79-6	S5

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	1030	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	83-32-9	
Acenaphthylene	ND	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	208-96-8	
Anthracene	2200	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	120-12-7	
Benzo(a)anthracene	2360	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	56-55-3	
Benzo(a)pyrene	2040	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	50-32-8	
Benzo(b)fluoranthene	2540	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	205-99-2	
Benzo(g,h,i)perylene	963	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	191-24-2	
Benzo(k)fluoranthene	950	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	207-08-9	
Chrysene	2040	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	218-01-9	
Dibenz(a,h)anthracene	357	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	53-70-3	
Fluoranthene	5260	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	206-44-0	
Fluorene	2030	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	86-73-7	
Indeno(1,2,3-cd)pyrene	1020	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	193-39-5	
Naphthalene	735	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	91-20-3	
Phenanthrene	5160	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	85-01-8	
Pyrene	4170	ug/kg	283	25	04/13/18 17:54	04/17/18 16:40	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	0	%	42-125	25	04/13/18 17:54	04/17/18 16:40	321-60-8	D4,S4

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) Lab ID: 10427291009 Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	0	%	57-125	25	04/13/18 17:54	04/17/18 16:40	1718-51-0	S4
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1170	1	04/24/18 10:23	04/24/18 21:05	67-64-1	
Allyl chloride	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	107-05-1	
Benzene	ND	ug/kg	23.4	1	04/24/18 10:23	04/24/18 21:05	71-43-2	
Bromobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	108-86-1	
Bromochloromethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	74-97-5	
Bromodichloromethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	75-27-4	
Bromoform	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	75-25-2	
Bromomethane	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	74-83-9	
2-Butanone (MEK)	ND	ug/kg	292	1	04/24/18 10:23	04/24/18 21:05	78-93-3	
n-Butylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	104-51-8	
sec-Butylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	135-98-8	
tert-Butylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	98-06-6	
Carbon tetrachloride	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	56-23-5	
Chlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	108-90-7	
Chloroethane	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	75-00-3	
Chloroform	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	67-66-3	
Chloromethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	74-87-3	
2-Chlorotoluene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	95-49-8	
4-Chlorotoluene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	96-12-8	
Dibromochloromethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	106-93-4	
Dibromomethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	75-71-8	
1,1-Dichloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	75-34-3	
1,2-Dichloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	107-06-2	
1,1-Dichloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	156-60-5	
Dichlorofluoromethane	ND	ug/kg	584	1	04/24/18 10:23	04/24/18 21:05	75-43-4	
1,2-Dichloropropane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	78-87-5	
1,3-Dichloropropane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	142-28-9	
2,2-Dichloropropane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	594-20-7	
1,1-Dichloropropene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	60-29-7	
Ethylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	292	1	04/24/18 10:23	04/24/18 21:05	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Sample: TS-SB-03 (1.5-3.0 S) **Lab ID: 10427291009** Collected: 04/12/18 19:55 Received: 04/13/18 08:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	98-82-8	
p-Isopropyltoluene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	99-87-6	
Methylene Chloride	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	292	1	04/24/18 10:23	04/24/18 21:05	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	1634-04-4	
Naphthalene	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	91-20-3	
n-Propylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	103-65-1	
Styrene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	79-34-5	
Tetrachloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	127-18-4	
Tetrahydrofuran	ND	ug/kg	2340	1	04/24/18 10:23	04/24/18 21:05	109-99-9	
Toluene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	79-00-5	
Trichloroethene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	79-01-6	
Trichlorofluoromethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	234	1	04/24/18 10:23	04/24/18 21:05	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	58.4	1	04/24/18 10:23	04/24/18 21:05	108-67-8	
Vinyl chloride	ND	ug/kg	23.4	1	04/24/18 10:23	04/24/18 21:05	75-01-4	
Xylene (Total)	ND	ug/kg	175	1	04/24/18 10:23	04/24/18 21:05	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/24/18 10:23	04/24/18 21:05	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/24/18 10:23	04/24/18 21:05	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	04/24/18 10:23	04/24/18 21:05	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	11.3	5	04/23/18 11:09	04/24/18 13:26	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	9.4	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.42	1	04/25/18 11:00	04/25/18 13:25	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	6.1	mg/kg	0.97	1	04/18/18 14:45	04/19/18 20:09	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 141622 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 559956 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/27/18 14:14	N3

METHOD BLANK: 559957 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/27/18 14:20	N3

METHOD BLANK: 559958 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/27/18 14:27	N3

LABORATORY CONTROL SAMPLE: 559959

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	99.7	116	117	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559960 559961

Parameter	Units	10427018004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	374	387	412	449	110	116	65-135	9	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559962 559963

Parameter	Units	10427291002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	344	356	391	403	114	113	65-135	3	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 533955 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2900195 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/24/18 16:15	
a,a,a-Trifluorotoluene (S)	%.	98	80-150	04/24/18 16:15	

LABORATORY CONTROL SAMPLE & LCSD: 2900196 2900197

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	43.1	43.6	86	87	80-120	1	20	
a,a,a-Trifluorotoluene (S)	%.				99	99	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2901282 2901283

Parameter	Units	10428008010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	ND	54.1	53.3	51.3	51.0	95	96	80-120	1	20	
a,a,a-Trifluorotoluene (S)	%.						98	99	80-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532422

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891608

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/19/18 18:07	

LABORATORY CONTROL SAMPLE: 2891609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.52	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891610 2891611

Parameter	Units	10427084001		2891610		2891611		% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec			
Mercury	mg/kg	0.60	.65	.62	1.2	1.5	100	137	80-120	16 20 E,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532423 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891612 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.9	04/21/18 19:02	
Barium	mg/kg	ND	0.50	04/21/18 19:02	
Boron	mg/kg	ND	7.4	04/21/18 19:02	
Copper	mg/kg	ND	0.50	04/21/18 19:02	
Iron	mg/kg	ND	2.5	04/21/18 19:02	
Manganese	mg/kg	ND	0.25	04/21/18 19:02	
Nickel	mg/kg	ND	0.99	04/21/18 19:02	
Silver	mg/kg	ND	0.50	04/21/18 19:02	
Tin	mg/kg	ND	3.7	04/21/18 19:02	
Titanium	mg/kg	ND	1.2	04/21/18 19:02	
Zinc	mg/kg	ND	0.99	04/21/18 19:02	

LABORATORY CONTROL SAMPLE: 2891613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	952	864	91	80-120	
Barium	mg/kg	47.6	47.5	100	80-120	
Boron	mg/kg	47.6	43.8	92	80-120	
Copper	mg/kg	47.6	45.2	95	80-120	
Iron	mg/kg	952	927	97	80-120	
Manganese	mg/kg	47.6	47.9	101	80-120	
Nickel	mg/kg	47.6	46.5	98	80-120	
Silver	mg/kg	23.8	21.5	90	80-120	
Tin	mg/kg	47.6	44.9	94	80-120	
Titanium	mg/kg	47.6	45.8	96	80-120	
Zinc	mg/kg	47.6	45.2	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891614 2891615

Parameter	Units	2891614		2891615		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Aluminum	mg/kg	10700	1400	1370	12800	12900	148	161	75-125	1	20	P6
Barium	mg/kg	134	70	68.7	183	185	70	75	75-125	1	20	M1
Boron	mg/kg	802	70	68.7	962	1030	228	335	75-125	7	20	P6
Copper	mg/kg	20.2	70	68.7	74.2	73.4	77	77	75-125	1	20	
Iron	mg/kg	34200	1400	1370	35600	35400	99	89	75-125	0	20	
Manganese	mg/kg	185	70	68.7	241	239	79	78	75-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2891614		2891615		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427291001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Nickel	mg/kg	22.5	70	68.7	74.6	73.8	74	75	75-125	1	20	M1	
Silver	mg/kg	ND	35	34.3	26.2	25.8	75	75	75-125	2	20		
Tin	mg/kg	ND	70	68.7	49.7	49.0	67	67	75-125	1	20	M1	
Titanium	mg/kg	589	70	68.7	624	626	50	55	75-125	0	20	P6	
Zinc	mg/kg	180	70	68.7	240	238	85	85	75-125	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 437531

Analysis Method: EPA 6020

QC Batch Method: EPA 3050B

Analysis Description: 6020 MET

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2021107

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	04/21/18 01:07	N2

LABORATORY CONTROL SAMPLE: 2021108

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.8	3.7	99	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021109 2021110

Parameter	Units	10427291001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Chromium	mg/kg	53.4	5.64	61.8	5.49	58.5	152	94	75-125	6	20	N2,P6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532416 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891584 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	04/16/18 16:04	
Arsenic	mg/kg	ND	0.50	04/16/18 16:04	
Beryllium	mg/kg	ND	0.20	04/16/18 16:04	
Cadmium	mg/kg	ND	0.080	04/16/18 16:04	
Cobalt	mg/kg	ND	0.50	04/16/18 16:04	
Lead	mg/kg	ND	0.10	04/16/18 16:04	
Lithium	mg/kg	ND	0.50	04/16/18 16:04	
Selenium	mg/kg	ND	0.50	04/16/18 16:04	
Strontium	mg/kg	ND	0.50	04/16/18 16:04	
Vanadium	mg/kg	ND	1.0	04/16/18 16:04	

LABORATORY CONTROL SAMPLE: 2891585

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49	48.4	99	80-120	
Arsenic	mg/kg	49	47.0	96	80-120	
Beryllium	mg/kg	49	46.7	95	80-120	
Cadmium	mg/kg	49	47.9	98	80-120	
Cobalt	mg/kg	49	48.1	98	80-120	
Lead	mg/kg	49	48.5	99	80-120	
Lithium	mg/kg	49	47.0	96	80-120	
Selenium	mg/kg	49	46.8	96	80-120	
Strontium	mg/kg	49	47.3	96	80-120	
Vanadium	mg/kg	49	47.7	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891586 2891587

Parameter	Units	10427286001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Antimony	mg/kg	ND	50.9	50.9	36.3	36.1	71	71	75-125	0	20	M6
Arsenic	mg/kg	1.5	50.9	50.9	46.8	47.2	89	90	75-125	1	20	
Beryllium	mg/kg	ND	50.9	50.9	46.4	49.9	91	98	75-125	7	20	
Cadmium	mg/kg	0.18	50.9	50.9	46.7	47.0	91	92	75-125	0	20	
Cobalt	mg/kg	2.7	50.9	50.9	48.1	48.6	89	90	75-125	1	20	
Lead	mg/kg	1.7	50.9	50.9	48.3	48.2	92	91	75-125	0	20	
Lithium	mg/kg	3.0	50.9	50.9	48.7	52.0	90	96	75-125	6	20	
Selenium	mg/kg	ND	50.9	50.9	46.6	48.7	91	96	75-125	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2891586		2891587		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427286001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Strontium	mg/kg	11.5	50.9	50.9	56.2	57.0	88	90	75-125	1	20		
Vanadium	mg/kg	12.9	50.9	50.9	60.9	60.4	94	93	75-125	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 533208

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427291001, 10427291002

SAMPLE DUPLICATE: 2897020

Parameter	Units	10427291002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.6	11.4	8	30	

SAMPLE DUPLICATE: 2897108

Parameter	Units	10427829003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.5	6.7	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 533359

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

SAMPLE DUPLICATE: 2897274

Parameter	Units	10427291006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.8	21.5	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 533981 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2900460 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/24/18 14:55	
1,1-Dichloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,1-Dichloroethene	ug/kg	ND	50.0	04/24/18 14:55	
1,1-Dichloropropene	ug/kg	ND	50.0	04/24/18 14:55	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,2,3-Trichloropropane	ug/kg	ND	200	04/24/18 14:55	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/24/18 14:55	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/24/18 14:55	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,2-Dichloroethane	ug/kg	ND	50.0	04/24/18 14:55	
1,2-Dichloropropane	ug/kg	ND	50.0	04/24/18 14:55	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
1,3-Dichloropropane	ug/kg	ND	50.0	04/24/18 14:55	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
2,2-Dichloropropane	ug/kg	ND	200	04/24/18 14:55	
2-Butanone (MEK)	ug/kg	ND	250	04/24/18 14:55	
2-Chlorotoluene	ug/kg	ND	50.0	04/24/18 14:55	
4-Chlorotoluene	ug/kg	ND	50.0	04/24/18 14:55	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/24/18 14:55	
Acetone	ug/kg	ND	1000	04/24/18 14:55	
Allyl chloride	ug/kg	ND	200	04/24/18 14:55	
Benzene	ug/kg	ND	20.0	04/24/18 14:55	
Bromobenzene	ug/kg	ND	50.0	04/24/18 14:55	
Bromochloromethane	ug/kg	ND	50.0	04/24/18 14:55	
Bromodichloromethane	ug/kg	ND	50.0	04/24/18 14:55	
Bromoform	ug/kg	ND	500	04/24/18 14:55	MN
Bromomethane	ug/kg	ND	500	04/24/18 14:55	
Carbon tetrachloride	ug/kg	ND	50.0	04/24/18 14:55	
Chlorobenzene	ug/kg	ND	50.0	04/24/18 14:55	
Chloroethane	ug/kg	ND	500	04/24/18 14:55	
Chloroform	ug/kg	ND	50.0	04/24/18 14:55	
Chloromethane	ug/kg	ND	200	04/24/18 14:55	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/24/18 14:55	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

METHOD BLANK: 2900460

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/24/18 14:55	
Dibromochloromethane	ug/kg	ND	200	04/24/18 14:55	
Dibromomethane	ug/kg	ND	50.0	04/24/18 14:55	
Dichlorodifluoromethane	ug/kg	ND	200	04/24/18 14:55	
Dichlorofluoromethane	ug/kg	ND	500	04/24/18 14:55	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/24/18 14:55	
Ethylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/24/18 14:55	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/24/18 14:55	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/24/18 14:55	
Methylene Chloride	ug/kg	ND	200	04/24/18 14:55	
n-Butylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
n-Propylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
Naphthalene	ug/kg	ND	200	04/24/18 14:55	
p-Isopropyltoluene	ug/kg	ND	50.0	04/24/18 14:55	
sec-Butylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
Styrene	ug/kg	ND	50.0	04/24/18 14:55	
tert-Butylbenzene	ug/kg	ND	50.0	04/24/18 14:55	
Tetrachloroethene	ug/kg	ND	50.0	04/24/18 14:55	
Tetrahydrofuran	ug/kg	ND	2000	04/24/18 14:55	
Toluene	ug/kg	ND	50.0	04/24/18 14:55	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/24/18 14:55	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/24/18 14:55	
Trichloroethene	ug/kg	ND	50.0	04/24/18 14:55	
Trichlorofluoromethane	ug/kg	ND	200	04/24/18 14:55	
Vinyl chloride	ug/kg	ND	20.0	04/24/18 14:55	
Xylene (Total)	ug/kg	ND	150	04/24/18 14:55	
1,2-Dichloroethane-d4 (S)	%	96	75-125	04/24/18 14:55	
4-Bromofluorobenzene (S)	%	99	75-125	04/24/18 14:55	
Toluene-d8 (S)	%	96	75-125	04/24/18 14:55	

LABORATORY CONTROL SAMPLE & LCSD: 2900461

2900462

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	873	843	87	84	59-125	3	20	
1,1,1-Trichloroethane	ug/kg	1000	981	967	98	97	59-125	1	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	854	774	85	77	58-125	10	20	
1,1,2-Trichloroethane	ug/kg	1000	824	795	82	79	64-125	4	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	833	853	83	85	65-125	2	20	
1,1-Dichloroethane	ug/kg	1000	864	866	86	87	63-125	0	20	
1,1-Dichloroethene	ug/kg	1000	862	857	86	86	59-125	1	20	
1,1-Dichloropropene	ug/kg	1000	984	952	98	95	64-125	3	20	
1,2,3-Trichlorobenzene	ug/kg	1000	841	801	84	80	55-126	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE & LCSD:		2900461	2900462		LCS	LCSD	% Rec		Max	
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
1,2,3-Trichloropropane	ug/kg	1000	821	781	82	78	62-125	5	20	
1,2,4-Trichlorobenzene	ug/kg	1000	866	799	87	80	62-125	8	20	
1,2,4-Trimethylbenzene	ug/kg	1000	857	780	86	78	59-125	9	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2120	1960	85	78	54-125	8	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	885	829	89	83	64-125	6	20	
1,2-Dichlorobenzene	ug/kg	1000	838	807	84	81	63-125	4	20	
1,2-Dichloroethane	ug/kg	1000	786	759	79	76	57-125	3	20	
1,2-Dichloropropane	ug/kg	1000	813	790	81	79	67-125	3	20	
1,3,5-Trimethylbenzene	ug/kg	1000	852	801	85	80	59-125	6	20	
1,3-Dichlorobenzene	ug/kg	1000	851	790	85	79	64-125	7	20	
1,3-Dichloropropane	ug/kg	1000	809	768	81	77	64-125	5	20	
1,4-Dichlorobenzene	ug/kg	1000	772	743	77	74	63-125	4	20	
2,2-Dichloropropane	ug/kg	1000	926	889	93	89	37-126	4	20	
2-Butanone (MEK)	ug/kg	5000	4220	4240	84	85	48-125	0	20	
2-Chlorotoluene	ug/kg	1000	853	794	85	79	62-125	7	20	
4-Chlorotoluene	ug/kg	1000	831	789	83	79	63-125	5	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4010	3890	80	78	52-135	3	20	
Acetone	ug/kg	5000	5120	4760	102	95	65-125	7	20	
Allyl chloride	ug/kg	1000	834	837	83	84	52-125	0	20	
Benzene	ug/kg	1000	842	832	84	83	61-125	1	20	
Bromobenzene	ug/kg	1000	880	827	88	83	64-125	6	20	
Bromochloromethane	ug/kg	1000	932	869	93	87	65-125	7	20	
Bromodichloromethane	ug/kg	1000	886	831	89	83	57-125	6	20	
Bromoform	ug/kg	1000	827	788	83	79	57-125	5	20	
Bromomethane	ug/kg	1000	831	750	83	75	60-125	10	20	
Carbon tetrachloride	ug/kg	1000	1010	963	101	96	58-125	5	20	
Chlorobenzene	ug/kg	1000	801	787	80	79	66-125	2	20	
Chloroethane	ug/kg	1000	901	853	90	85	62-125	5	20	
Chloroform	ug/kg	1000	872	837	87	84	59-125	4	20	
Chloromethane	ug/kg	1000	826	748	83	75	50-125	10	20	
cis-1,2-Dichloroethene	ug/kg	1000	913	880	91	88	61-125	4	20	
cis-1,3-Dichloropropene	ug/kg	1000	879	848	88	85	61-125	3	20	
Dibromochloromethane	ug/kg	1000	812	762	81	76	60-125	6	20	
Dibromomethane	ug/kg	1000	860	816	86	82	69-125	5	20	
Dichlorodifluoromethane	ug/kg	1000	786	715	79	72	38-125	9	20	
Dichlorofluoromethane	ug/kg	1000	951	846	95	85	67-125	12	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1640	1750	164	175	60-125	7	20	L3,SS
Ethylbenzene	ug/kg	1000	861	829	86	83	62-125	4	20	
Hexachloro-1,3-butadiene	ug/kg	1000	862	789	86	79	56-125	9	20	
Isopropylbenzene (Cumene)	ug/kg	1000	882	856	88	86	65-125	3	20	
Methyl-tert-butyl ether	ug/kg	1000	788	793	79	79	59-125	1	20	
Methylene Chloride	ug/kg	1000	782	787	78	79	64-125	1	20	
n-Butylbenzene	ug/kg	1000	891	848	89	85	59-125	5	20	
n-Propylbenzene	ug/kg	1000	897	795	90	80	61-125	12	20	
Naphthalene	ug/kg	1000	871	803	87	80	53-125	8	20	
p-Isopropyltoluene	ug/kg	1000	883	840	88	84	63-125	5	20	
sec-Butylbenzene	ug/kg	1000	830	821	83	82	62-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE & LCSD: 2900461		2900462								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Styrene	ug/kg	1000	826	796	83	80	66-125	4	20	
tert-Butylbenzene	ug/kg	1000	865	807	87	81	64-125	7	20	
Tetrachloroethene	ug/kg	1000	907	867	91	87	67-125	5	20	
Tetrahydrofuran	ug/kg	10000	9540	8450	95	84	62-125	12	20	
Toluene	ug/kg	1000	792	766	79	77	61-125	3	20	
trans-1,2-Dichloroethene	ug/kg	1000	872	879	87	88	64-125	1	20	
trans-1,3-Dichloropropene	ug/kg	1000	872	830	87	83	56-125	5	20	
Trichloroethene	ug/kg	1000	878	815	88	81	67-125	7	20	
Trichlorofluoromethane	ug/kg	1000	985	917	99	92	65-125	7	20	
Vinyl chloride	ug/kg	1000	916	820	92	82	57-125	11	20	
Xylene (Total)	ug/kg	3000	2470	2420	82	81	62-125	2	20	
1,2-Dichloroethane-d4 (S)	%				95	99	75-125			
4-Bromofluorobenzene (S)	%				100	99	75-125			
Toluene-d8 (S)	%				99	100	75-125			

MATRIX SPIKE SAMPLE: 2900463		10428008001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	1080	1190	110	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1080	1220	113	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1080	1140	105	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1080	1130	104	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1080	1140	105	60-142	
1,1-Dichloroethane	ug/kg	ND	1080	1170	108	57-140	
1,1-Dichloroethene	ug/kg	ND	1080	1140	105	59-139	
1,1-Dichloropropene	ug/kg	ND	1080	1230	113	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1080	1100	101	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1080	1140	105	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1080	1120	103	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1080	1100	101	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2710	2890	107	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1080	1220	113	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1080	1130	104	70-142	
1,2-Dichloroethane	ug/kg	ND	1080	1080	99	58-132	
1,2-Dichloropropane	ug/kg	ND	1080	1120	104	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1080	1140	105	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1080	1100	102	71-142	
1,3-Dichloropropane	ug/kg	ND	1080	1130	104	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1080	1070	99	68-142	
2,2-Dichloropropane	ug/kg	ND	1080	1150	107	34-150	
2-Butanone (MEK)	ug/kg	ND	5420	5620	104	51-150	
2-Chlorotoluene	ug/kg	ND	1080	1090	100	66-144	
4-Chlorotoluene	ug/kg	ND	1080	1110	102	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5420	5480	101	63-150	
Acetone	ug/kg	ND	5420	6520	120	54-150	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

MATRIX SPIKE SAMPLE: 2900463		10428008001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Allyl chloride	ug/kg	ND	1080	1170	108	53-135	
Benzene	ug/kg	ND	1080	1150	107	65-135	
Bromobenzene	ug/kg	ND	1080	1150	106	71-141	
Bromochloromethane	ug/kg	ND	1080	1130	104	62-145	
Bromodichloromethane	ug/kg	ND	1080	1170	108	59-148	
Bromoform	ug/kg	ND	1080	1160	108	57-145	
Bromomethane	ug/kg	ND	1080	1040	96	51-129	
Carbon tetrachloride	ug/kg	ND	1080	1240	114	55-144	
Chlorobenzene	ug/kg	ND	1080	1110	102	70-142	
Chloroethane	ug/kg	ND	1080	1090	101	61-135	
Chloroform	ug/kg	ND	1080	1080	99	58-135	
Chloromethane	ug/kg	ND	1080	971	90	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1080	1130	105	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1080	1210	112	62-142	
Dibromochloromethane	ug/kg	ND	1080	1100	102	65-141	
Dibromomethane	ug/kg	ND	1080	1190	110	72-150	
Dichlorodifluoromethane	ug/kg	ND	1080	862	80	30-125	
Dichlorofluoromethane	ug/kg	ND	1080	1090	101	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1080	2460	227	62-135	M0,SS
Ethylbenzene	ug/kg	ND	1080	1140	105	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1080	1150	106	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1080	1210	111	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1080	1070	99	63-139	
Methylene Chloride	ug/kg	ND	1080	1070	98	58-135	
n-Butylbenzene	ug/kg	ND	1080	1140	105	63-150	
n-Propylbenzene	ug/kg	ND	1080	1130	103	70-146	
Naphthalene	ug/kg	ND	1080	1100	101	63-150	
p-Isopropyltoluene	ug/kg	ND	1080	1130	104	72-150	
sec-Butylbenzene	ug/kg	ND	1080	1130	104	66-150	
Styrene	ug/kg	ND	1080	1160	107	72-146	
tert-Butylbenzene	ug/kg	ND	1080	1110	102	71-148	
Tetrachloroethene	ug/kg	ND	1080	1230	114	70-150	
Tetrahydrofuran	ug/kg	ND	10800	11500	106	62-150	
Toluene	ug/kg	ND	1080	1070	99	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1080	1210	112	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1080	1150	107	57-147	
Trichloroethene	ug/kg	ND	1080	1170	108	62-150	
Trichlorofluoromethane	ug/kg	ND	1080	1190	110	51-150	
Vinyl chloride	ug/kg	ND	1080	1060	98	45-132	
Xylene (Total)	ug/kg	ND	3250	3330	103	75-140	
1,2-Dichloroethane-d4 (S)	%				97	75-125	
4-Bromofluorobenzene (S)	%				98	75-125	
Toluene-d8 (S)	%				98	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

SAMPLE DUPLICATE: 2900464

Parameter	Units	10428008002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

SAMPLE DUPLICATE: 2900464

Parameter	Units	10428008002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	97	95	5		
4-Bromofluorobenzene (S)	%.	93	100	14		
Toluene-d8 (S)	%.	97	99	10		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532516 Analysis Method: EPA 8081B
 QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2891965 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/19/18 23:12	
4,4'-DDE	ug/kg	ND	3.3	04/19/18 23:12	
4,4'-DDT	ug/kg	ND	3.3	04/19/18 23:12	
Aldrin	ug/kg	ND	1.7	04/19/18 23:12	
alpha-BHC	ug/kg	ND	1.7	04/19/18 23:12	
alpha-Chlordane	ug/kg	ND	1.7	04/19/18 23:12	
beta-BHC	ug/kg	ND	1.7	04/19/18 23:12	
Chlordane (Technical)	ug/kg	ND	16.7	04/19/18 23:12	
delta-BHC	ug/kg	ND	1.7	04/19/18 23:12	
Dieldrin	ug/kg	ND	3.3	04/19/18 23:12	
Endosulfan I	ug/kg	ND	1.7	04/19/18 23:12	
Endosulfan II	ug/kg	ND	3.3	04/19/18 23:12	
Endosulfan sulfate	ug/kg	ND	3.3	04/19/18 23:12	
Endrin	ug/kg	ND	3.3	04/19/18 23:12	
Endrin aldehyde	ug/kg	ND	3.3	04/19/18 23:12	
Endrin ketone	ug/kg	ND	3.3	04/19/18 23:12	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/19/18 23:12	
gamma-Chlordane	ug/kg	ND	1.7	04/19/18 23:12	
Heptachlor	ug/kg	ND	1.7	04/19/18 23:12	
Heptachlor epoxide	ug/kg	ND	1.7	04/19/18 23:12	
Methoxychlor	ug/kg	ND	16.7	04/19/18 23:12	
Toxaphene	ug/kg	ND	50.0	04/19/18 23:12	
Decachlorobiphenyl (S)	%	93	30-150	04/19/18 23:12	
Tetrachloro-m-xylene (S)	%	98	30-150	04/19/18 23:12	

LABORATORY CONTROL SAMPLE: 2891966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	32.6	98	62-127	
4,4'-DDE	ug/kg	33.3	31.8	95	66-125	
4,4'-DDT	ug/kg	33.3	31.9	96	67-128	
Aldrin	ug/kg	16.7	15.0	90	66-125	
alpha-BHC	ug/kg	16.7	16.0	96	64-125	
alpha-Chlordane	ug/kg	16.7	15.5	93	68-125	
beta-BHC	ug/kg	16.7	15.8	95	69-125	
delta-BHC	ug/kg	16.7	13.2	79	42-133	
Dieldrin	ug/kg	33.3	34.3	103	69-126	
Endosulfan I	ug/kg	16.7	14.8	89	63-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2891966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endosulfan II	ug/kg	33.3	33.3	100	69-125	
Endosulfan sulfate	ug/kg	33.3	29.6	89	56-137	
Endrin	ug/kg	33.3	31.7	95	69-125	
Endrin aldehyde	ug/kg	33.3	31.6	95	65-125	
Endrin ketone	ug/kg	33.3	33.9	102	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	16.0	96	67-125	
gamma-Chlordane	ug/kg	16.7	14.1	85	63-125	
Heptachlor	ug/kg	16.7	16.5	99	69-125	
Heptachlor epoxide	ug/kg	16.7	15.7	94	68-125	
Methoxychlor	ug/kg	167	163	98	65-134	
Decachlorobiphenyl (S)	%			91	30-150	
Tetrachloro-m-xylene (S)	%			94	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891992 2891993

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427291002 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	212	37.2	37.1	174	220	-103	21	56-125	23	20 M6, R1
4,4'-DDE	ug/kg	87.8	37.2	37.1	89.4	109	4	58	32-150	20	20 M6
4,4'-DDT	ug/kg	ND	37.2	37.1	63.9J	63.3J	172	170	60-132		20 M6
Aldrin	ug/kg	ND	18.7	18.6	18.6J	17.7J	100	95	56-125		20
alpha-BHC	ug/kg	ND	18.7	18.6	16.8J	18.5J	90	99	54-136		20
alpha-Chlordane	ug/kg	ND	18.7	18.6	35.2J	41.6	189	224	54-133		20 M6
beta-BHC	ug/kg	ND	18.7	18.6	20.2J	21.1J	109	113	30-150		20
delta-BHC	ug/kg	ND	18.7	18.6	14.3J	14.6J	77	78	45-145		20
Dieldrin	ug/kg	ND	37.2	37.1	38.3J	39.4J	103	106	47-150		20
Endosulfan I	ug/kg	ND	18.7	18.6	18.9J	19.1J	101	103	35-145		20
Endosulfan II	ug/kg	ND	37.2	37.1	38.6J	39.6J	104	107	50-147		20
Endosulfan sulfate	ug/kg	ND	37.2	37.1	35.5J	35.6J	95	96	54-132		20
Endrin	ug/kg	ND	37.2	37.1	34.7J	35.4J	93	95	62-125		20
Endrin aldehyde	ug/kg	ND	37.2	37.1	38.9J	39.6J	105	106	33-150		20
Endrin ketone	ug/kg	ND	37.2	37.1	37.7J	37.9J	101	102	56-144		20
gamma-BHC (Lindane)	ug/kg	ND	18.7	18.6	17.1J	18J	92	97	63-125		20
gamma-Chlordane	ug/kg	ND	18.7	18.6	26.5J	30.4J	143	164	45-132		20 M6
Heptachlor	ug/kg	ND	18.7	18.6	18.9J	19.3J	101	104	51-142		20
Heptachlor epoxide	ug/kg	ND	18.7	18.6	24.4J	27.6J	131	148	50-142		20 M6
Methoxychlor	ug/kg	ND	187	186	155J	168J	83	90	58-139		20
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		2M, D4, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532316

Analysis Method: EPA 8082A

QC Batch Method: EPA 3550

Analysis Description: 8082A GCS PCB

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2890749

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/16/18 15:30	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/16/18 15:30	
Decachlorobiphenyl (S)	%.	90	30-134	04/16/18 15:30	
Tetrachloro-m-xylene (S)	%.	89	48-125	04/16/18 15:30	

LABORATORY CONTROL SAMPLE: 2890750

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	578	87	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	588	88	62-125	
Decachlorobiphenyl (S)	%.			97	30-134	
Tetrachloro-m-xylene (S)	%.			97	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890820 2890821

Parameter	Units	10427018004 Result	MSD		MS		MSD		% Rec Limits	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec		RPD	RPD	
PCB-1016 (Aroclor 1016)	ug/kg	ND	779	782	625	654	80	84	30-150	5	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	779	782	650	643	83	82	30-138	1	30	
Decachlorobiphenyl (S)	%.						80	76	30-134			
Tetrachloro-m-xylene (S)	%.						80	80	48-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 532275

Analysis Method: EPA 8270D

QC Batch Method: EPA 3550

Analysis Description: 8270D Solid MSSV

Associated Lab Samples: 10427291002, 10427291003, 10427291005, 10427291006, 10427291007, 10427291009

METHOD BLANK: 2890574

Matrix: Solid

Associated Lab Samples: 10427291002, 10427291003, 10427291005, 10427291006, 10427291007, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,2-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/18/18 16:57	
1,3-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1,4-Dichlorobenzene	ug/kg	ND	330	04/18/18 16:57	
1-Methylnaphthalene	ug/kg	ND	330	04/18/18 16:57	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dichlorophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dimethylphenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dinitrophenol	ug/kg	ND	330	04/18/18 16:57	
2,4-Dinitrotoluene	ug/kg	ND	330	04/18/18 16:57	
2,6-Dinitrotoluene	ug/kg	ND	330	04/18/18 16:57	
2-Chloronaphthalene	ug/kg	ND	330	04/18/18 16:57	
2-Chlorophenol	ug/kg	ND	330	04/18/18 16:57	
2-Methylnaphthalene	ug/kg	ND	330	04/18/18 16:57	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/18/18 16:57	
2-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
2-Nitrophenol	ug/kg	ND	330	04/18/18 16:57	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/18/18 16:57	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/18/18 16:57	
3-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/18/18 16:57	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/18/18 16:57	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/18/18 16:57	
4-Chloroaniline	ug/kg	ND	330	04/18/18 16:57	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/18/18 16:57	
4-Nitroaniline	ug/kg	ND	330	04/18/18 16:57	
4-Nitrophenol	ug/kg	ND	330	04/18/18 16:57	
Acenaphthene	ug/kg	ND	330	04/18/18 16:57	
Acenaphthylene	ug/kg	ND	330	04/18/18 16:57	
Anthracene	ug/kg	ND	330	04/18/18 16:57	
Benzo(a)anthracene	ug/kg	ND	330	04/18/18 16:57	
Benzo(a)pyrene	ug/kg	ND	330	04/18/18 16:57	
Benzo(b)fluoranthene	ug/kg	ND	330	04/18/18 16:57	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/18/18 16:57	
Benzo(k)fluoranthene	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/18/18 16:57	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/18/18 16:57	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/18/18 16:57	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

METHOD BLANK: 2890574

Matrix: Solid

Associated Lab Samples: 10427291002, 10427291003, 10427291005, 10427291006, 10427291007, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/18/18 16:57	
Carbazole	ug/kg	ND	330	04/18/18 16:57	
Chrysene	ug/kg	ND	330	04/18/18 16:57	
Di-n-butylphthalate	ug/kg	ND	330	04/18/18 16:57	
Di-n-octylphthalate	ug/kg	ND	330	04/18/18 16:57	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/18/18 16:57	
Dibenzofuran	ug/kg	ND	330	04/18/18 16:57	
Diethylphthalate	ug/kg	ND	330	04/18/18 16:57	
Dimethylphthalate	ug/kg	ND	330	04/18/18 16:57	
Fluoranthene	ug/kg	ND	330	04/18/18 16:57	
Fluorene	ug/kg	ND	330	04/18/18 16:57	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/18/18 16:57	
Hexachlorobenzene	ug/kg	ND	330	04/18/18 16:57	
Hexachloroethane	ug/kg	ND	330	04/18/18 16:57	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/18/18 16:57	
Isophorone	ug/kg	ND	330	04/18/18 16:57	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/18/18 16:57	
N-Nitrosodimethylamine	ug/kg	ND	330	04/18/18 16:57	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/18/18 16:57	
Naphthalene	ug/kg	ND	330	04/18/18 16:57	
Nitrobenzene	ug/kg	ND	330	04/18/18 16:57	
Pentachlorophenol	ug/kg	ND	670	04/18/18 16:57	
Phenanthrene	ug/kg	ND	330	04/18/18 16:57	
Phenol	ug/kg	ND	330	04/18/18 16:57	
Pyrene	ug/kg	ND	330	04/18/18 16:57	
2,4,6-Tribromophenol (S)	%	77	60-125	04/18/18 16:57	
2-Fluorobiphenyl (S)	%	79	30-132	04/18/18 16:57	
2-Fluorophenol (S)	%	72	40-125	04/18/18 16:57	
Nitrobenzene-d5 (S)	%	71	43-125	04/18/18 16:57	
p-Terphenyl-d14 (S)	%	86	62-125	04/18/18 16:57	
Phenol-d6 (S)	%	72	48-125	04/18/18 16:57	

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	983	59	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1010	61	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1320	79	63-125	
1,3-Dichlorobenzene	ug/kg	1670	980	59	38-125	
1,4-Dichlorobenzene	ug/kg	1670	984	59	39-125	
1-Methylnaphthalene	ug/kg	1670	1190	72	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1340	81	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1340	80	61-125	
2,4-Dichlorophenol	ug/kg	1670	1230	74	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1140	69	51-125	
2,4-Dinitrophenol	ug/kg	1670	1290	78	30-132	6M
2,4-Dinitrotoluene	ug/kg	1670	1580	95	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1490	89	63-125	
2-Chloronaphthalene	ug/kg	1670	1310	79	61-125	
2-Chlorophenol	ug/kg	1670	987	59	46-125	
2-Methylnaphthalene	ug/kg	1670	1160	70	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1070	64	50-125	
2-Nitroaniline	ug/kg	1670	1330	80	61-125	
2-Nitrophenol	ug/kg	1670	1110	66	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1150	69	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1260	75	47-125	
3-Nitroaniline	ug/kg	1670	1270	76	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1540J	93	30-141	6M
4-Bromophenylphenyl ether	ug/kg	1670	1380	83	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1360	82	64-125	
4-Chloroaniline	ug/kg	1670	853	51	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1390	83	64-125	
4-Nitroaniline	ug/kg	1670	1290	77	59-125	
4-Nitrophenol	ug/kg	1670	1300	78	54-125	
Acenaphthene	ug/kg	1670	1320	79	62-125	
Acenaphthylene	ug/kg	1670	1320	79	61-125	
Anthracene	ug/kg	1670	1360	81	66-125	
Benzo(a)anthracene	ug/kg	1670	1410	84	69-125	
Benzo(a)pyrene	ug/kg	1670	1410	85	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1410	85	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1470	88	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1440	87	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1070	64	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	914	55	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	773	46	37-125	6M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1530	92	69-131	
Butylbenzylphthalate	ug/kg	1670	1500	90	69-129	
Carbazole	ug/kg	1670	1430	86	66-125	
Chrysene	ug/kg	1670	1430	86	68-125	
Di-n-butylphthalate	ug/kg	1670	1510	90	69-125	
Di-n-octylphthalate	ug/kg	1670	1580	95	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1510	91	64-125	
Dibenzofuran	ug/kg	1670	1410	84	65-125	
Diethylphthalate	ug/kg	1670	1450	87	67-125	
Dimethylphthalate	ug/kg	1670	1440	86	67-125	
Fluoranthene	ug/kg	1670	1430	86	66-125	
Fluorene	ug/kg	1670	1390	83	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	951	57	40-125	
Hexachlorobenzene	ug/kg	1670	1400	84	62-125	
Hexachloroethane	ug/kg	1670	939	56	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1490	90	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2890575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1170	70	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1090	65	50-125	
N-Nitrosodimethylamine	ug/kg	1670	956	57	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1390	84	65-125	
Naphthalene	ug/kg	1670	1040	62	48-125	
Nitrobenzene	ug/kg	1670	984	59	48-125	
Pentachlorophenol	ug/kg	1670	1300	78	41-125	
Phenanthrene	ug/kg	1670	1350	81	66-125	
Phenol	ug/kg	1670	1000	60	46-125	
Pyrene	ug/kg	1670	1420	85	69-125	
2,4,6-Tribromophenol (S)	%			84	60-125	
2-Fluorobiphenyl (S)	%			69	30-132	
2-Fluorophenol (S)	%			52	40-125	
Nitrobenzene-d5 (S)	%			53	43-125	
p-Terphenyl-d14 (S)	%			85	62-125	
Phenol-d6 (S)	%			57	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890607 2890608

Parameter	Units	10427018008		MSD		MSD		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,2,4-Trichlorobenzene	ug/kg	ND	1940	1950	1400J	1390J	73	71	30-127		30		
1,2-Dichlorobenzene	ug/kg	ND	1940	1950	1330J	1150J	69	59	30-125		30		
1,2-Diphenylhydrazine	ug/kg	ND	1940	1950	1410J	1360J	73	70	30-150		30		
1,3-Dichlorobenzene	ug/kg	ND	1940	1950	1270J	1060J	66	54	30-125		30		
1,4-Dichlorobenzene	ug/kg	ND	1940	1950	1280J	1100J	66	57	30-125		30		
1-Methylnaphthalene	ug/kg	ND	1940	1950	1560J	1520J	79	76	42-125		30		
2,4,5-Trichlorophenol	ug/kg	ND	1940	1950	1400J	1400J	73	72	30-150		30		
2,4,6-Trichlorophenol	ug/kg	ND	1940	1950	1450J	1420J	75	73	30-150		30		
2,4-Dichlorophenol	ug/kg	ND	1940	1950	1490J	1420J	77	73	30-135		30		
2,4-Dimethylphenol	ug/kg	ND	1940	1950	1540J	1470J	79	76	30-148		30		
2,4-Dinitrophenol	ug/kg	ND	1940	1950	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	1940	1950	1030J	818J	53	42	30-150		30		
2,6-Dinitrotoluene	ug/kg	ND	1940	1950	1150J	1010J	60	52	30-150		30		
2-Chloronaphthalene	ug/kg	ND	1940	1950	1460J	1430J	76	74	30-138		30		
2-Chlorophenol	ug/kg	ND	1940	1950	1480J	1380J	76	71	30-130		30		
2-Methylnaphthalene	ug/kg	ND	1940	1950	1570J	1510J	79	76	46-125		30		
2-Methylphenol(o-Cresol)	ug/kg	ND	1940	1950	1440J	1440J	75	74	30-133		30		
2-Nitroaniline	ug/kg	ND	1940	1950	1610J	1580J	83	81	30-150		30		
2-Nitrophenol	ug/kg	ND	1940	1950	813J	ND	42	31	30-134		30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1940	1950	1460J	1380J	75	71	30-138		30		
3,3'-Dichlorobenzidine	ug/kg	ND	1940	1950	ND	ND	32	41	30-149		30		
3-Nitroaniline	ug/kg	ND	1940	1950	1780J	1750J	92	90	30-150		30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	1940	1950	ND	ND	0	0	30-133		30	M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2890607			2890608								
Parameter	Units	10427018008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec Limits	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec			
4-Bromophenylphenyl ether	ug/kg	ND	1940	1950	1520J	1460J	79	75	44-125	30	
4-Chloro-3-methylphenol	ug/kg	ND	1940	1950	1490J	1440J	77	74	30-150	30	
4-Chloroaniline	ug/kg	ND	1940	1950	ND	ND	49	46	30-125	30	
4-Chlorophenylphenyl ether	ug/kg	ND	1940	1950	1530J	1440J	79	74	44-125	30	
4-Nitroaniline	ug/kg	ND	1940	1950	1670J	1750J	86	90	30-150	30	
4-Nitrophenol	ug/kg	ND	1940	1950	ND	1280J	47	66	30-150	30	
Acenaphthene	ug/kg	ND	1940	1950	1540J	1790J	80	92	40-125	30	
Acenaphthylene	ug/kg	ND	1940	1950	1560J	1460J	81	75	30-150	30	
Anthracene	ug/kg	ND	1940	1950	1650J	2080J	77	99	30-150	30	
Benzo(a)anthracene	ug/kg	ND	1940	1950	1910J	3050J	78	136	30-150	30	
Benzo(a)pyrene	ug/kg	ND	1940	1950	1810J	2600J	94	134	30-150	30	
Benzo(b)fluoranthene	ug/kg	ND	1940	1950	1910J	2960J	99	152	30-150	30	M1
Benzo(g,h,i)perylene	ug/kg	ND	1940	1950	1930J	2310J	99	119	30-150	30	
Benzo(k)fluoranthene	ug/kg	ND	1940	1950	1630J	2200J	84	113	30-150	30	
bis(2-Chloroethoxy)methane	ug/kg	ND	1940	1950	1420J	1370J	73	70	30-134	30	
bis(2-Chloroethyl) ether	ug/kg	ND	1940	1950	1210J	1180J	62	61	30-125	30	
bis(2-Chloroisopropyl) ether	ug/kg	ND	1940	1950	1150J	1050J	59	54	30-125	30	6M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1940	1950	3800J	2960J	76	33	30-150	30	
Butylbenzylphthalate	ug/kg	ND	1940	1950	1790J	1760J	93	91	30-150	30	
Carbazole	ug/kg	ND	1940	1950	1650J	1960J	82	98	41-125	30	
Chrysene	ug/kg	ND	1940	1950	2000J	3120J	82	139	30-150	30	
Di-n-butylphthalate	ug/kg	ND	1940	1950	2730J	1930J	141	99	30-150	30	
Di-n-octylphthalate	ug/kg	ND	1940	1950	1870J	1770J	96	91	30-150	30	
Dibenz(a,h)anthracene	ug/kg	ND	1940	1950	1570J	1660J	81	85	30-150	30	
Dibenzofuran	ug/kg	ND	1940	1950	1620J	1590J	84	82	45-125	30	
Diethylphthalate	ug/kg	ND	1940	1950	1530J	1530J	79	79	30-150	30	
Dimethylphthalate	ug/kg	ND	1940	1950	1600J	1500J	82	77	30-150	30	
Fluoranthene	ug/kg	ND	1940	1950	2260J	5090	76	221	30-150	30	M1
Fluorene	ug/kg	ND	1940	1950	1660J	1740J	77	81	30-150	30	
Hexachloro-1,3-butadiene	ug/kg	ND	1940	1950	1420J	1230J	73	63	30-128	30	
Hexachlorobenzene	ug/kg	ND	1940	1950	1570J	1500J	81	77	30-150	30	
Hexachloroethane	ug/kg	ND	1940	1950	ND	ND	41	26	30-125	30	M1
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1940	1950	1690J	2080J	88	107	30-150	30	
Isophorone	ug/kg	ND	1940	1950	1440J	1380J	74	71	30-140	30	
N-Nitroso-di-n-propylamine	ug/kg	ND	1940	1950	1410J	1300J	73	67	30-147	30	
N-Nitrosodimethylamine	ug/kg	ND	1940	1950	ND	ND	52	45	30-125	30	
N-Nitrosodiphenylamine	ug/kg	ND	1940	1950	1760J	1700J	91	87	30-150	30	
Naphthalene	ug/kg	ND	1940	1950	1470J	1460J	76	75	44-125	30	
Nitrobenzene	ug/kg	ND	1940	1950	1290J	1270J	67	65	30-136	30	
Pentachlorophenol	ug/kg	ND	1940	1950	ND	ND	56	48	30-150	30	
Phenanthrene	ug/kg	ND	1940	1950	2210J	4090	53	150	30-150	30	
Phenol	ug/kg	ND	1940	1950	1380J	1340J	71	69	30-129	30	
Pyrene	ug/kg	ND	1940	1950	2560J	5020	76	203	30-150	30	M1
2,4,6-Tribromophenol (S)	%						64	68	60-125		
2-Fluorobiphenyl (S)	%						61	64	30-132		
2-Fluorophenol (S)	%						54	56	40-125		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2890607		2890608		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Nitrobenzene-d5 (S)	%.					50	52	43-125		P3
p-Terphenyl-d14 (S)	%.					79	78	62-125		
Phenol-d6 (S)	%.					59	57	48-125		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 533467 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427291001, 10427291004, 10427291008

METHOD BLANK: 2897876 Matrix: Solid

Associated Lab Samples: 10427291001, 10427291004, 10427291008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,2-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/24/18 14:01	
1,3-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1,4-Dichlorobenzene	ug/kg	ND	330	04/24/18 14:01	
1-Methylnaphthalene	ug/kg	ND	330	04/24/18 14:01	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dichlorophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dimethylphenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dinitrophenol	ug/kg	ND	330	04/24/18 14:01	
2,4-Dinitrotoluene	ug/kg	ND	330	04/24/18 14:01	
2,6-Dinitrotoluene	ug/kg	ND	330	04/24/18 14:01	
2-Chloronaphthalene	ug/kg	ND	330	04/24/18 14:01	
2-Chlorophenol	ug/kg	ND	330	04/24/18 14:01	
2-Methylnaphthalene	ug/kg	ND	330	04/24/18 14:01	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/24/18 14:01	
2-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
2-Nitrophenol	ug/kg	ND	330	04/24/18 14:01	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/24/18 14:01	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/24/18 14:01	
3-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/24/18 14:01	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/24/18 14:01	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/24/18 14:01	
4-Chloroaniline	ug/kg	ND	330	04/24/18 14:01	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/24/18 14:01	
4-Nitroaniline	ug/kg	ND	330	04/24/18 14:01	
4-Nitrophenol	ug/kg	ND	330	04/24/18 14:01	
Acenaphthene	ug/kg	ND	330	04/24/18 14:01	
Acenaphthylene	ug/kg	ND	330	04/24/18 14:01	
Anthracene	ug/kg	ND	330	04/24/18 14:01	
Benzo(a)anthracene	ug/kg	ND	330	04/24/18 14:01	
Benzo(a)pyrene	ug/kg	ND	330	04/24/18 14:01	
Benzo(b)fluoranthene	ug/kg	ND	330	04/24/18 14:01	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/24/18 14:01	
Benzo(k)fluoranthene	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/24/18 14:01	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/24/18 14:01	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/24/18 14:01	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Project No.: 10427291

METHOD BLANK: 2897876

Matrix: Solid

Associated Lab Samples: 10427291001, 10427291004, 10427291008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/24/18 14:01	
Carbazole	ug/kg	ND	330	04/24/18 14:01	
Chrysene	ug/kg	ND	330	04/24/18 14:01	
Di-n-butylphthalate	ug/kg	ND	330	04/24/18 14:01	
Di-n-octylphthalate	ug/kg	ND	330	04/24/18 14:01	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/24/18 14:01	
Dibenzofuran	ug/kg	ND	330	04/24/18 14:01	
Diethylphthalate	ug/kg	ND	330	04/24/18 14:01	
Dimethylphthalate	ug/kg	ND	330	04/24/18 14:01	
Fluoranthene	ug/kg	ND	330	04/24/18 14:01	
Fluorene	ug/kg	ND	330	04/24/18 14:01	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/24/18 14:01	
Hexachlorobenzene	ug/kg	ND	330	04/24/18 14:01	
Hexachloroethane	ug/kg	ND	330	04/24/18 14:01	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/24/18 14:01	
Isophorone	ug/kg	ND	330	04/24/18 14:01	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/24/18 14:01	
N-Nitrosodimethylamine	ug/kg	ND	330	04/24/18 14:01	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/24/18 14:01	
Naphthalene	ug/kg	ND	330	04/24/18 14:01	
Nitrobenzene	ug/kg	ND	330	04/24/18 14:01	
Pentachlorophenol	ug/kg	ND	670	04/24/18 14:01	
Phenanthrene	ug/kg	ND	330	04/24/18 14:01	
Phenol	ug/kg	ND	330	04/24/18 14:01	
Pyrene	ug/kg	ND	330	04/24/18 14:01	
2,4,6-Tribromophenol (S)	%	93	60-125	04/24/18 14:01	
2-Fluorobiphenyl (S)	%	90	30-132	04/24/18 14:01	
2-Fluorophenol (S)	%	85	40-125	04/24/18 14:01	
Nitrobenzene-d5 (S)	%	85	43-125	04/24/18 14:01	
p-Terphenyl-d14 (S)	%	108	62-125	04/24/18 14:01	
Phenol-d6 (S)	%	85	48-125	04/24/18 14:01	

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1270	76	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1260	75	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1430	86	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1220	73	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1230	74	39-125	
1-Methylnaphthalene	ug/kg	1670	1360	82	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1490	89	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1470	88	61-125	
2,4-Dichlorophenol	ug/kg	1670	1440	86	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1350	81	51-125	
2,4-Dinitrophenol	ug/kg	1670	1200	72	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1740	104	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1630	98	63-125	
2-Chloronaphthalene	ug/kg	1670	1430	86	61-125	
2-Chlorophenol	ug/kg	1670	1270	76	46-125	
2-Methylnaphthalene	ug/kg	1670	1340	81	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1290	77	50-125	
2-Nitroaniline	ug/kg	1670	1510	91	61-125	
2-Nitrophenol	ug/kg	1670	1350	81	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1360	81	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1450	87	47-125	
3-Nitroaniline	ug/kg	1670	1460	88	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1530J	92	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1520	91	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1560	93	64-125	
4-Chloroaniline	ug/kg	1670	1050	63	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1500	90	64-125	
4-Nitroaniline	ug/kg	1670	1510	91	59-125	
4-Nitrophenol	ug/kg	1670	1430	86	54-125	
Acenaphthene	ug/kg	1670	1440	87	62-125	
Acenaphthylene	ug/kg	1670	1450	87	61-125	
Anthracene	ug/kg	1670	1490	89	66-125	
Benzo(a)anthracene	ug/kg	1670	1580	95	69-125	
Benzo(a)pyrene	ug/kg	1670	1560	94	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1540	92	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1650	99	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1590	96	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1310	79	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1200	72	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1030	62	37-125 6M	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1800	108	69-131	
Butylbenzylphthalate	ug/kg	1670	1740	104	69-129	
Carbazole	ug/kg	1670	1580	95	66-125	
Chrysene	ug/kg	1670	1580	95	68-125	
Di-n-butylphthalate	ug/kg	1670	1700	102	69-125	
Di-n-octylphthalate	ug/kg	1670	1830	110	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1680	101	64-125	
Dibenzofuran	ug/kg	1670	1500	90	65-125	
Diethylphthalate	ug/kg	1670	1600	96	67-125	
Dimethylphthalate	ug/kg	1670	1590	95	67-125	
Fluoranthene	ug/kg	1670	1560	94	66-125	
Fluorene	ug/kg	1670	1490	89	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1210	72	40-125	
Hexachlorobenzene	ug/kg	1670	1550	93	62-125	
Hexachloroethane	ug/kg	1670	1230	74	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1650	99	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

LABORATORY CONTROL SAMPLE: 2897877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1350	81	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1260	75	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1170	70	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1570	94	65-125	
Naphthalene	ug/kg	1670	1270	76	48-125	
Nitrobenzene	ug/kg	1670	1250	75	48-125	
Pentachlorophenol	ug/kg	1670	1220	73	41-125	
Phenanthrene	ug/kg	1670	1490	89	66-125	
Phenol	ug/kg	1670	1250	75	46-125	
Pyrene	ug/kg	1670	1600	96	69-125	
2,4,6-Tribromophenol (S)	%			97	60-125	
2-Fluorobiphenyl (S)	%			81	30-132	
2-Fluorophenol (S)	%			74	40-125	
Nitrobenzene-d5 (S)	%			72	43-125	
p-Terphenyl-d14 (S)	%			99	62-125	
Phenol-d6 (S)	%			74	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878 2897879

Parameter	Units	10427906003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,2,4-Trichlorobenzene	ug/kg	<70.8	1850	1840	1210	1310	66	71	30-127	8	30		
1,2-Dichlorobenzene	ug/kg	<68.9	1850	1840	1250	1250	68	68	30-125	0	30		
1,2-Diphenylhydrazine	ug/kg	<66.0	1850	1840	1010	1080	55	59	30-150	7	30		
1,3-Dichlorobenzene	ug/kg	<68.1	1850	1840	1220	1220	66	66	30-125	0	30		
1,4-Dichlorobenzene	ug/kg	<66.5	1850	1840	1230	1210	67	66	30-125	2	30		
1-Methylnaphthalene	ug/kg	<57.3	1850	1840	1270	1360	69	74	42-125	7	30		
2,4,5-Trichlorophenol	ug/kg	<71.3	1850	1840	1160	1250	63	68	30-150	8	30		
2,4,6-Trichlorophenol	ug/kg	<51.8	1850	1840	1240	1360	67	74	30-150	9	30		
2,4-Dichlorophenol	ug/kg	<68.8	1850	1840	1290	1390	70	75	30-135	8	30		
2,4-Dimethylphenol	ug/kg	<137	1850	1840	1290	1430	70	78	30-148	10	30		
2,4-Dinitrophenol	ug/kg	<82.1	1850	1840	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	<49.4	1850	1840	555	642	30	35	30-150	14	30		
2,6-Dinitrotoluene	ug/kg	<50.9	1850	1840	710	771	39	42	30-150	8	30		
2-Chloronaphthalene	ug/kg	<51.8	1850	1840	1250	1330	68	72	30-138	6	30		
2-Chlorophenol	ug/kg	<72.6	1850	1840	1320	1350	72	74	30-130	2	30		
2-Methylnaphthalene	ug/kg	<56.6	1850	1840	1260	1350	68	73	46-125	7	30		
2-Methylphenol(o-Cresol)	ug/kg	<91.9	1850	1840	1310	1370	71	74	30-133	4	30		
2-Nitroaniline	ug/kg	<80.6	1850	1840	1610	1730	87	94	30-150	7	30		
2-Nitrophenol	ug/kg	<68.7	1850	1840	562	610	30	33	30-134	8	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	<82.3	1850	1840	1330	1390	72	75	30-138	5	30		
3,3'-Dichlorobenzidine	ug/kg	<87.3	1850	1840	1460	1420	79	77	30-149	2	30		
3-Nitroaniline	ug/kg	<89.4	1850	1840	1860	1890	101	102	30-150	1	30		
4,6-Dinitro-2-methylphenol	ug/kg	<147	1850	1840	ND	ND	0	0	30-133		30	M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878												2897879											
Parameter	Units	10427906003		MS		MSD		MS		MSD		% Rec		Max		Qual							
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD											
4-Bromophenylphenyl ether	ug/kg	<61.5	1850	1840	1260	1390	68	76	44-125	10	30												
4-Chloro-3-methylphenol	ug/kg	<50.6	1850	1840	1280	1420	70	77	30-150	10	30												
4-Chloroaniline	ug/kg	<102	1850	1840	1060	953	57	52	30-125	11	30												
4-Chlorophenylphenyl ether	ug/kg	<49.9	1850	1840	1280	1360	69	74	44-125	6	30												
4-Nitroaniline	ug/kg	<65.1	1850	1840	1800	1850	97	100	30-150	3	30												
4-Nitrophenol	ug/kg	<105	1850	1840	1100	1160	60	63	30-150	6	30												
Acenaphthene	ug/kg	<59.8	1850	1840	1150	1250	63	68	40-125	8	30												
Acenaphthylene	ug/kg	<50.0	1850	1840	1220	1320	66	72	30-150	8	30												
Anthracene	ug/kg	<52.6	1850	1840	1220	1340	66	73	30-150	9	30												
Benzo(a)anthracene	ug/kg	<42.4	1850	1840	1220	1340	66	73	30-150	10	30												
Benzo(a)pyrene	ug/kg	<41.3	1850	1840	1120	1270	61	69	30-150	13	30												
Benzo(b)fluoranthene	ug/kg	<44.2	1850	1840	1200	1290	65	70	30-150	7	30												
Benzo(g,h,i)perylene	ug/kg	<31.6	1850	1840	967	1090	53	59	30-150	12	30												
Benzo(k)fluoranthene	ug/kg	<44.2	1850	1840	1160	1300	63	71	30-150	12	30												
bis(2-Chloroethoxy)methane	ug/kg	<70.8	1850	1840	1300	1370	71	74	30-134	5	30												
bis(2-Chloroethyl) ether	ug/kg	<80.0	1850	1840	1200	1280	65	70	30-125	7	30												
bis(2-Chloroisopropyl) ether	ug/kg	<84.7	1850	1840	1050	1060	57	57	30-125	1	30	6M											
bis(2-Ethylhexyl)phthalate	ug/kg	104J	1850	1840	1490	1660	75	84	30-150	11	30												
Butylbenzylphthalate	ug/kg	140J	1850	1840	1560	1660	77	83	30-150	7	30												
Carbazole	ug/kg	<49.1	1850	1840	1360	1450	74	79	41-125	7	30												
Chrysene	ug/kg	<36.7	1850	1840	1210	1350	66	73	30-150	11	30												
Di-n-butylphthalate	ug/kg	<49.9	1850	1840	1430	1550	78	84	30-150	8	30												
Di-n-octylphthalate	ug/kg	<112	1850	1840	1450	1570	79	85	30-150	7	30												
Dibenz(a,h)anthracene	ug/kg	<37.7	1850	1840	1150	1260	63	69	30-150	9	30												
Dibenzofuran	ug/kg	<53.0	1850	1840	1270	1370	69	74	45-125	7	30												
Diethylphthalate	ug/kg	<43.3	1850	1840	1380	1480	75	81	30-150	7	30												
Dimethylphthalate	ug/kg	<56.2	1850	1840	1400	1470	76	80	30-150	5	30												
Fluoranthene	ug/kg	<39.0	1850	1840	1210	1340	65	72	30-150	10	30												
Fluorene	ug/kg	<50.9	1850	1840	1260	1340	68	73	30-150	6	30												
Hexachloro-1,3-butadiene	ug/kg	<84.2	1850	1840	1150	1270	62	69	30-128	9	30												
Hexachlorobenzene	ug/kg	<47.2	1850	1840	1060	1220	58	66	30-150	14	30												
Hexachloroethane	ug/kg	<74.7	1850	1840	303J	252J	16	14	30-125		30	M1											
Indeno(1,2,3-cd)pyrene	ug/kg	<42.5	1850	1840	1070	1180	58	64	30-150	9	30												
Isophorone	ug/kg	<83.7	1850	1840	1230	1350	67	73	30-140	9	30												
N-Nitroso-di-n-propylamine	ug/kg	<112	1850	1840	1300	1290	70	70	30-147	0	30												
N-Nitrosodimethylamine	ug/kg	<95.6	1850	1840	1240	1190	67	65	30-125	4	30												
N-Nitrosodiphenylamine	ug/kg	<44.9	1850	1840	1360	1470	74	80	30-150	8	30												
Naphthalene	ug/kg	<69.5	1850	1840	1240	1320	67	72	44-125	6	30												
Nitrobenzene	ug/kg	<73.4	1850	1840	1180	1230	64	67	30-136	4	30												
Pentachlorophenol	ug/kg	<108	1850	1840	528J	591J	29	32	30-150		30	M1											
Phenanthrene	ug/kg	<50.0	1850	1840	1240	1330	66	71	30-150	8	30												
Phenol	ug/kg	<70.6	1850	1840	1250	1290	68	70	30-129	3	30												
Pyrene	ug/kg	<38.4	1850	1840	1270	1400	67	74	30-150	10	30												
2,4,6-Tribromophenol (S)	%						62	67	60-125														
2-Fluorobiphenyl (S)	%						67	71	30-132														
2-Fluorophenol (S)	%						68	69	40-125														

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897878				2897879				% Rec Limits	Max RPD	Qual
		10427906003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Nitrobenzene-d5 (S)	%.							61	65	43-125		
p-Terphenyl-d14 (S)	%.							72	78	62-125		
Phenol-d6 (S)	%.							66	70	48-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 532273 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10427291002, 10427291003, 10427291004, 10427291005, 10427291007, 10427291008, 10427291009

METHOD BLANK: 2890569 Matrix: Solid
Associated Lab Samples: 10427291002, 10427291003, 10427291004, 10427291005, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/16/18 16:05	
Acenaphthylene	ug/kg	ND	10.0	04/16/18 16:05	
Anthracene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(a)anthracene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(a)pyrene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/16/18 16:05	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/16/18 16:05	
Chrysene	ug/kg	ND	10.0	04/16/18 16:05	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/16/18 16:05	
Fluoranthene	ug/kg	ND	10.0	04/16/18 16:05	
Fluorene	ug/kg	ND	10.0	04/16/18 16:05	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/16/18 16:05	
Naphthalene	ug/kg	ND	10.0	04/16/18 16:05	
Phenanthrene	ug/kg	ND	10.0	04/16/18 16:05	
Pyrene	ug/kg	ND	10.0	04/16/18 16:05	
2-Fluorobiphenyl (S)	%	82	42-125	04/16/18 16:05	
p-Terphenyl-d14 (S)	%	104	57-125	04/16/18 16:05	

LABORATORY CONTROL SAMPLE: 2890570

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.5	73	52-125	
Acenaphthylene	ug/kg	33.3	27.4	82	50-125	
Anthracene	ug/kg	33.3	30.9	93	65-125	
Benzo(a)anthracene	ug/kg	33.3	32.2	97	60-125	
Benzo(a)pyrene	ug/kg	33.3	31.9	96	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.4	94	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	25.5	77	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	28.1	84	67-125	
Chrysene	ug/kg	33.3	29.3	88	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	23.6	71	63-125	
Fluoranthene	ug/kg	33.3	30.9	93	75-125	
Fluorene	ug/kg	33.3	26.4	79	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	24.7	74	63-125	
Naphthalene	ug/kg	33.3	27.2	82	49-125	
Phenanthrene	ug/kg	33.3	26.3	79	65-125	
Pyrene	ug/kg	33.3	30.2	91	64-125	
2-Fluorobiphenyl (S)	%			79	42-125	
p-Terphenyl-d14 (S)	%			108	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2890571		2890572		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Acenaphthene	ug/kg	ND	34.1	34.1	29.8	28.6	87	84	30-125	4	30	
Acenaphthylene	ug/kg	ND	34.1	34.1	29.8	30.2	87	88	30-133	1	30	
Anthracene	ug/kg	ND	34.1	34.1	41.5	41.5	122	122	30-150	0	30	
Benzo(a)anthracene	ug/kg	0.012 mg/kg	34.1	34.1	64.1	57.8	153	134	30-150	10	30	M1
Benzo(a)pyrene	ug/kg	0.013 mg/kg	34.1	34.1	60.0	53.0	137	116	30-150	12	30	
Benzo(b)fluoranthene	ug/kg	0.015 mg/kg	34.1	34.1	66.9	58.5	152	127	30-150	13	30	M1
Benzo(g,h,i)perylene	ug/kg	ND	34.1	34.1	40.8	36.9	120	108	30-150	10	30	
Benzo(k)fluoranthene	ug/kg	ND	34.1	34.1	43.9	40.5	129	119	30-150	8	30	
Chrysene	ug/kg	0.012 mg/kg	34.1	34.1	55.1	51.3	126	114	30-150	7	30	
Dibenz(a,h)anthracene	ug/kg	ND	34.1	34.1	25.2	25.0	74	73	30-131	1	30	
Fluoranthene	ug/kg	0.022 mg/kg	34.1	34.1	92.3	82.7	206	177	30-150	11	30	M1
Fluorene	ug/kg	ND	34.1	34.1	28.3	30.7	83	90	30-147	8	30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	34.1	34.1	36.0	34.8	105	102	30-150	3	30	
Naphthalene	ug/kg	ND	34.1	34.1	26.6	27.4	78	80	30-131	3	30	
Phenanthrene	ug/kg	ND	34.1	34.1	58.5	57.4	171	168	30-150	2	30	M1
Pyrene	ug/kg	0.018 mg/kg	34.1	34.1	78.5	70.6	176	153	30-150	11	30	M1
2-Fluorobiphenyl (S)	%.						78	79	42-125			
p-Terphenyl-d14 (S)	%.						106	104	57-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 532984 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10427291001, 10427291006

METHOD BLANK: 2894424 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/19/18 19:46	
Acenaphthylene	ug/kg	ND	10.0	04/19/18 19:46	
Anthracene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(a)anthracene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(a)pyrene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/19/18 19:46	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/19/18 19:46	
Chrysene	ug/kg	ND	10.0	04/19/18 19:46	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/19/18 19:46	
Fluoranthene	ug/kg	ND	10.0	04/19/18 19:46	
Fluorene	ug/kg	ND	10.0	04/19/18 19:46	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/19/18 19:46	
Naphthalene	ug/kg	ND	10.0	04/19/18 19:46	
Phenanthrene	ug/kg	ND	10.0	04/19/18 19:46	
Pyrene	ug/kg	ND	10.0	04/19/18 19:46	
2-Fluorobiphenyl (S)	%	79	42-125	04/19/18 19:46	
p-Terphenyl-d14 (S)	%	94	57-125	04/19/18 19:46	

LABORATORY CONTROL SAMPLE: 2894425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	22.0	66	52-125	
Acenaphthylene	ug/kg	33.3	21.2	64	50-125	
Anthracene	ug/kg	33.3	31.2	94	65-125	
Benzo(a)anthracene	ug/kg	33.3	27.4	82	60-125	
Benzo(a)pyrene	ug/kg	33.3	30.3	91	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	33.2	100	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	30.0	90	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	28.7	86	67-125	
Chrysene	ug/kg	33.3	30.5	91	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	30.0	90	63-125	
Fluoranthene	ug/kg	33.3	29.1	87	75-125	
Fluorene	ug/kg	33.3	24.1	72	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	30.1	90	63-125	
Naphthalene	ug/kg	33.3	21.6	65	49-125	
Phenanthrene	ug/kg	33.3	27.9	84	65-125	
Pyrene	ug/kg	33.3	28.3	85	64-125	
2-Fluorobiphenyl (S)	%			71	42-125	
p-Terphenyl-d14 (S)	%			102	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Parameter	Units	2894426		2894427		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427632001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Acenaphthene	ug/kg	ND	37.4	37.3	32.7	32.5	88	87	30-125	1	30		
Acenaphthylene	ug/kg	ND	37.4	37.3	47.8	41.6	128	112	30-133	14	30		
Anthracene	ug/kg	ND	37.4	37.3	43.8	42.9	117	115	30-150	2	30		
Benzo(a)anthracene	ug/kg	0.023	37.4	37.3	104	85.5	215	167	30-150	19	30	M1	
Benzo(a)pyrene	ug/kg	0.035	37.4	37.3	141	110	283	201	30-150	24	30	M1	
Benzo(b)fluoranthene	ug/kg	0.051	37.4	37.3	184	147	356	255	30-150	23	30	M1	
Benzo(g,h,i)perylene	ug/kg	0.033	37.4	37.3	120	97.0	233	172	30-150	21	30	M1	
Benzo(k)fluoranthene	ug/kg	0.018	37.4	37.3	79.2	61.6	164	117	30-150	25	30	M1	
Chrysene	ug/kg	0.032	37.4	37.3	127	101	254	184	30-150	23	30	M1	
Dibenz(a,h)anthracene	ug/kg	ND	37.4	37.3	52.3	46.5	140	125	30-131	12	30	M1	
Fluoranthene	ug/kg	0.054	37.4	37.3	211	162	419	288	30-150	26	30	M1	
Fluorene	ug/kg	ND	37.4	37.3	35.4	34.9	95	94	30-147	1	30		
Indeno(1,2,3-cd)pyrene	ug/kg	0.025	37.4	37.3	96.8	78.2	192	143	30-150	21	30	M1	
Naphthalene	ug/kg	ND	37.4	37.3	29.9	29.5	80	79	30-131	2	30		
Phenanthrene	ug/kg	0.028	37.4	37.3	124	113	256	227	30-150	9	30	M1	
Pyrene	ug/kg	0.057	37.4	37.3	223	167	443	295	30-150	29	30	M1	
2-Fluorobiphenyl (S)	%.						85	85	42-125				
p-Terphenyl-d14 (S)	%.						96	98	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch:	438492	Analysis Method:	EPA 7196A
QC Batch Method:	EPA 3060A	Analysis Description:	7196 Chromium, Hexavalent
Associated Lab Samples:	10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009		

METHOD BLANK:	2026403	Matrix:	Solid
Associated Lab Samples:	10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009		

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/24/18 13:00	

LABORATORY CONTROL SAMPLE: 2026404

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1010	924	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026421 2026422

Parameter	Units	10427291008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1080	1150	839	962	77	84	75-125	14	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026423 2026424

Parameter	Units	10427291008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	42.9	42.7	28.6	29.2	67	68	75-125	2	20	M3

SAMPLE DUPLICATE: 2026425

Parameter	Units	10427354004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

QC Batch: 286553 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004

METHOD BLANK: 1676305 Matrix: Solid
Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/20/18 13:32	

LABORATORY CONTROL SAMPLE: 1676306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676307 1676308

Parameter	Units	40167646001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.10J	2.22	2.34	2.3	2.4	98	99	80-120	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676309 1676310

Parameter	Units	10427291004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.67	3.98	3.65	4.2	3.7	88	82	80-120	12	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 286937 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 1678360 Matrix: Solid
 Associated Lab Samples: 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/25/18 13:16	

LABORATORY CONTROL SAMPLE: 1678361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678362 1678363

Parameter	Units	10427642001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Cyanide	mg/kg	0.52	3.72	3.72	4.0	4.1	93	97	80-120	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678364 1678365

Parameter	Units	10428096003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Cyanide	mg/kg	0.45	2.7	2.6	3.5	2.7	112	87	80-120	25	20	M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

QC Batch: 140842 Analysis Method: EPA 9056A
 QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

METHOD BLANK: 557419 Matrix: Solid
 Associated Lab Samples: 10427291001, 10427291002, 10427291003, 10427291004, 10427291005, 10427291006, 10427291007, 10427291008, 10427291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/19/18 16:14	

LABORATORY CONTROL SAMPLE: 557418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	52.6	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557420 557421

Parameter	Units	10427291004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	1.4	49.8	49.8	12.1	12.9	21	23	80-120	7	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557422 557423

Parameter	Units	10427291008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/kg	ND	49.7	49	35.4	35.5	69	71	80-120	0	20	M1

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M Sample was black in color and viscous. Sample was centrifuged and decanted prior to analysis.

2M Sample was black in color.

3M Sample was dark brown in color.

4M Sample was light brown in color.

5M Sample was yellow in color.

6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

ANALYTE QUALIFIERS

M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
MN	The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
N3	Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
T6	High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427291001	FD-SB-F1 (10-14.5 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291002	FB-SB-G1 (5-10 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291003	FD-TT-05 (4-9 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291004	FD-TT-06 (2-5 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291005	FD-TT-07 (6-11 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291006	FD-TT-08 (5-12 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291007	TS-SB-01 (5-8 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291008	TS-SB-02 (5-10 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3550	532516	EPA 8081B	533098
10427291002	FB-SB-G1 (5-10 S)	EPA 3550	532516	EPA 8081B	533098
10427291003	FD-TT-05 (4-9 WM)	EPA 3550	532516	EPA 8081B	533098
10427291004	FD-TT-06 (2-5 WM)	EPA 3550	532516	EPA 8081B	533098
10427291005	FD-TT-07 (6-11 WM)	EPA 3550	532516	EPA 8081B	533098
10427291006	FD-TT-08 (5-12 WM)	EPA 3550	532516	EPA 8081B	533098
10427291007	TS-SB-01 (5-8 WM)	EPA 3550	532516	EPA 8081B	533098
10427291008	TS-SB-02 (5-10 S)	EPA 3550	532516	EPA 8081B	533098
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3550	532516	EPA 8081B	533098
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3550	532316	EPA 8082A	532613
10427291002	FB-SB-G1 (5-10 S)	EPA 3550	532316	EPA 8082A	532613
10427291003	FD-TT-05 (4-9 WM)	EPA 3550	532316	EPA 8082A	532613
10427291004	FD-TT-06 (2-5 WM)	EPA 3550	532316	EPA 8082A	532613
10427291005	FD-TT-07 (6-11 WM)	EPA 3550	532316	EPA 8082A	532613
10427291006	FD-TT-08 (5-12 WM)	EPA 3550	532316	EPA 8082A	532613
10427291007	TS-SB-01 (5-8 WM)	EPA 3550	532316	EPA 8082A	532613
10427291008	TS-SB-02 (5-10 S)	EPA 3550	532316	EPA 8082A	532613
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3550	532316	EPA 8082A	532613
10427291001	FD-SB-F1 (10-14.5 S)	WI MOD DRO	532497	WI MOD DRO	532700
10427291002	FB-SB-G1 (5-10 S)	WI MOD DRO	532497	WI MOD DRO	532700
10427291003	FD-TT-05 (4-9 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291004	FD-TT-06 (2-5 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291005	FD-TT-07 (6-11 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291006	FD-TT-08 (5-12 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291007	TS-SB-01 (5-8 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427291008	TS-SB-02 (5-10 S)	WI MOD DRO	532497	WI MOD DRO	532700
10427291009	TS-SB-03 (1.5-3.0 S)	WI MOD DRO	532497	WI MOD DRO	532700
10427291001	FD-SB-F1 (10-14.5 S)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291002	FB-SB-G1 (5-10 S)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291003	FD-TT-05 (4-9 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291004	FD-TT-06 (2-5 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291005	FD-TT-07 (6-11 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291006	FD-TT-08 (5-12 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291007	TS-SB-01 (5-8 WM)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291008	TS-SB-02 (5-10 S)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 5030 Medium Soil	533955	WI MOD GRO	534062
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3050	532423	EPA 6010C	533058

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427291002	FB-SB-G1 (5-10 S)	EPA 3050	532423	EPA 6010C	533058
10427291003	FD-TT-05 (4-9 WM)	EPA 3050	532423	EPA 6010C	533058
10427291004	FD-TT-06 (2-5 WM)	EPA 3050	532423	EPA 6010C	533058
10427291005	FD-TT-07 (6-11 WM)	EPA 3050	532423	EPA 6010C	533058
10427291006	FD-TT-08 (5-12 WM)	EPA 3050	532423	EPA 6010C	533058
10427291007	TS-SB-01 (5-8 WM)	EPA 3050	532423	EPA 6010C	533058
10427291008	TS-SB-02 (5-10 S)	EPA 3050	532423	EPA 6010C	533058
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3050	532423	EPA 6010C	533058
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3050B	437531	EPA 6020	438359
10427291002	FB-SB-G1 (5-10 S)	EPA 3050B	437531	EPA 6020	438359
10427291003	FD-TT-05 (4-9 WM)	EPA 3050B	437531	EPA 6020	438359
10427291004	FD-TT-06 (2-5 WM)	EPA 3050B	437531	EPA 6020	438359
10427291005	FD-TT-07 (6-11 WM)	EPA 3050B	437531	EPA 6020	438359
10427291006	FD-TT-08 (5-12 WM)	EPA 3050B	437531	EPA 6020	438359
10427291007	TS-SB-01 (5-8 WM)	EPA 3050B	437531	EPA 6020	438359
10427291008	TS-SB-02 (5-10 S)	EPA 3050B	437531	EPA 6020	438359
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3050B	437531	EPA 6020	438359
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3050	532416	EPA 6020A	532552
10427291002	FB-SB-G1 (5-10 S)	EPA 3050	532416	EPA 6020A	532552
10427291003	FD-TT-05 (4-9 WM)	EPA 3050	532416	EPA 6020A	532552
10427291004	FD-TT-06 (2-5 WM)	EPA 3050	532416	EPA 6020A	532552
10427291005	FD-TT-07 (6-11 WM)	EPA 3050	532416	EPA 6020A	532552
10427291006	FD-TT-08 (5-12 WM)	EPA 3050	532416	EPA 6020A	532552
10427291007	TS-SB-01 (5-8 WM)	EPA 3050	532416	EPA 6020A	532552
10427291008	TS-SB-02 (5-10 S)	EPA 3050	532416	EPA 6020A	532552
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3050	532416	EPA 6020A	532552
10427291001	FD-SB-F1 (10-14.5 S)	EPA 7471	532422	EPA 7471	533051
10427291002	FB-SB-G1 (5-10 S)	EPA 7471	532422	EPA 7471	533051
10427291003	FD-TT-05 (4-9 WM)	EPA 7471	532422	EPA 7471	533051
10427291004	FD-TT-06 (2-5 WM)	EPA 7471	532422	EPA 7471	533051
10427291005	FD-TT-07 (6-11 WM)	EPA 7471	532422	EPA 7471	533051
10427291006	FD-TT-08 (5-12 WM)	EPA 7471	532422	EPA 7471	533051
10427291007	TS-SB-01 (5-8 WM)	EPA 7471	532422	EPA 7471	533051
10427291008	TS-SB-02 (5-10 S)	EPA 7471	532422	EPA 7471	533051
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 7471	532422	EPA 7471	533051
10427291001	FD-SB-F1 (10-14.5 S)	ASTM D2974	533208		
10427291002	FB-SB-G1 (5-10 S)	ASTM D2974	533208		
10427291003	FD-TT-05 (4-9 WM)	ASTM D2974	533359		
10427291004	FD-TT-06 (2-5 WM)	ASTM D2974	533359		
10427291005	FD-TT-07 (6-11 WM)	ASTM D2974	533359		
10427291006	FD-TT-08 (5-12 WM)	ASTM D2974	533359		
10427291007	TS-SB-01 (5-8 WM)	ASTM D2974	533359		
10427291008	TS-SB-02 (5-10 S)	ASTM D2974	533359		
10427291009	TS-SB-03 (1.5-3.0 S)	ASTM D2974	533359		
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3550	533467	EPA 8270D	533832

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427291002	FB-SB-G1 (5-10 S)	EPA 3550	532275	EPA 8270D	532657
10427291003	FD-TT-05 (4-9 WM)	EPA 3550	532275	EPA 8270D	532657
10427291004	FD-TT-06 (2-5 WM)	EPA 3550	533467	EPA 8270D	533832
10427291005	FD-TT-07 (6-11 WM)	EPA 3550	532275	EPA 8270D	532657
10427291006	FD-TT-08 (5-12 WM)	EPA 3550	532275	EPA 8270D	532657
10427291007	TS-SB-01 (5-8 WM)	EPA 3550	532275	EPA 8270D	532657
10427291008	TS-SB-02 (5-10 S)	EPA 3550	533467	EPA 8270D	533832
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3550	532275	EPA 8270D	532657
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3550	532984	EPA 8270D by SIM	533391
10427291002	FB-SB-G1 (5-10 S)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291003	FD-TT-05 (4-9 WM)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291004	FD-TT-06 (2-5 WM)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291005	FD-TT-07 (6-11 WM)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291006	FD-TT-08 (5-12 WM)	EPA 3550	532984	EPA 8270D by SIM	533391
10427291007	TS-SB-01 (5-8 WM)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291008	TS-SB-02 (5-10 S)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3550	532273	EPA 8270D by SIM	532620
10427291001	FD-SB-F1 (10-14.5 S)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291002	FB-SB-G1 (5-10 S)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291003	FD-TT-05 (4-9 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291004	FD-TT-06 (2-5 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291005	FD-TT-07 (6-11 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291006	FD-TT-08 (5-12 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291007	TS-SB-01 (5-8 WM)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291008	TS-SB-02 (5-10 S)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 5035/5030B	533981	EPA 8260B	533996
10427291001	FD-SB-F1 (10-14.5 S)	EPA 3060A	438492	EPA 7196A	438766
10427291002	FB-SB-G1 (5-10 S)	EPA 3060A	438492	EPA 7196A	438766
10427291003	FD-TT-05 (4-9 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291004	FD-TT-06 (2-5 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291005	FD-TT-07 (6-11 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291006	FD-TT-08 (5-12 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291007	TS-SB-01 (5-8 WM)	EPA 3060A	438492	EPA 7196A	438766
10427291008	TS-SB-02 (5-10 S)	EPA 3060A	438492	EPA 7196A	438766
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 3060A	438492	EPA 7196A	438766
10427291001	FD-SB-F1 (10-14.5 S)	Trivalent Chromium Calculation	439198		
10427291002	FB-SB-G1 (5-10 S)	Trivalent Chromium Calculation	439198		
10427291003	FD-TT-05 (4-9 WM)	Trivalent Chromium Calculation	439198		
10427291004	FD-TT-06 (2-5 WM)	Trivalent Chromium Calculation	439198		
10427291005	FD-TT-07 (6-11 WM)	Trivalent Chromium Calculation	439198		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427291006	FD-TT-08 (5-12 WM)	Trivalent Chromium Calculation	439198		
10427291007	TS-SB-01 (5-8 WM)	Trivalent Chromium Calculation	439198		
10427291008	TS-SB-02 (5-10 S)	Trivalent Chromium Calculation	439198		
10427291009	TS-SB-03 (1.5-3.0 S)	Trivalent Chromium Calculation	439198		
10427291001	FD-SB-F1 (10-14.5 S)	EPA 9012A	286553	EPA 9012	286614
10427291002	FB-SB-G1 (5-10 S)	EPA 9012A	286553	EPA 9012	286614
10427291003	FD-TT-05 (4-9 WM)	EPA 9012A	286553	EPA 9012	286614
10427291004	FD-TT-06 (2-5 WM)	EPA 9012A	286553	EPA 9012	286614
10427291005	FD-TT-07 (6-11 WM)	EPA 9012A	286937	EPA 9012	286958
10427291006	FD-TT-08 (5-12 WM)	EPA 9012A	286937	EPA 9012	286958
10427291007	TS-SB-01 (5-8 WM)	EPA 9012A	286937	EPA 9012	286958
10427291008	TS-SB-02 (5-10 S)	EPA 9012A	286937	EPA 9012	286958
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 9012A	286937	EPA 9012	286958
10427291001	FD-SB-F1 (10-14.5 S)	EPA 300.0	140842	EPA 9056A	140851
10427291002	FB-SB-G1 (5-10 S)	EPA 300.0	140842	EPA 9056A	140851
10427291003	FD-TT-05 (4-9 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291004	FD-TT-06 (2-5 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291005	FD-TT-07 (6-11 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291006	FD-TT-08 (5-12 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291007	TS-SB-01 (5-8 WM)	EPA 300.0	140842	EPA 9056A	140851
10427291008	TS-SB-02 (5-10 S)	EPA 300.0	140842	EPA 9056A	140851
10427291009	TS-SB-03 (1.5-3.0 S)	EPA 300.0	140842	EPA 9056A	140851

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Sample Condition Upon Receipt

Client Name: MPCA

Project #:

WO# : 10427291

PM: JMA

Due Date: 04/27/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 2.9 Cooler Temp Corrected (°C): 3.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: PGY/13/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>NO time on label</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased): _____	15.

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/13/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt

Client Name: Pace - Mpls.

Project #:

WO#: 12107161
 PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.3 Cooler Temp Corrected °C: 5.4 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 1.1 Date and Initials of Person Examining Contents: 4/16/18 CJS

Comments: BM 4/17/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Angela Loisel Date: 4/17/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO# : 12107161



12107161

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.9 Cooler Temp Corrected °C: 5.9 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/17/18 

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N


TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt Form (SCUR)

Client Name: PRGMN

Project #: **WO# : 40167542**

40167542

Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Tracking #: 1693529-1

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 75 Type of Ice: Wet Blue Dry None

Cooler Temperature Uncorr: 2 / Corr: 2 Samples on ice, cooling process has begun

Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Person examining contents:
Date: 4/17/18
Initials: SSM

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRVO</u> <u>SSM 4/17/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>client + labels have no collect time</u>
-Includes date/time/ID/Analysis Matrix:		<u>SSM 4/17/18</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Person Contacted: _____ Date/Time: _____ If checked, see attached form for additional comments
Comments/ Resolution: _____

Project Manager Review: CW Date: 4/17/18



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194564

Date/Time and Initials of person examining contents: 7/22 4/17/18 JAS

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 1990

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: A 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N

Cooler Temperature: 2.1/2.3 Ice Visible in Sample Containers?: Yes No N

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia?			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			<input checked="" type="checkbox"/>
Chain of Custody Present:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)?:		<input checked="" type="checkbox"/>	Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
Analysis:			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Trip Blank Present?:		<input checked="" type="checkbox"/>	
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC?:	<input checked="" type="checkbox"/>					
Except TCs, which only require sample ID						

Comments: _____

Page 122 of 140



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 25, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427291
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-SB-F1 (10-14.5 S) (10427291001)	A181607-01	Solid	04/12/2018	04/17/2018
FB-SB-G1 (5-10 S) (10427291002)	A181607-02	Solid	04/12/2018	04/17/2018
FD-TT-05 (4-9 WM) (10427291003)	A181607-03	Solid	04/12/2018	04/17/2018
FD-TT-06 (2-5 WM) (10427291004)	A181607-04	Solid	04/12/2018	04/17/2018
FD-TT-07 (6-11 WM) (10427291005)	A181607-05	Solid	04/12/2018	04/17/2018
FD-TT-08 (5-12 WM) (10427291006)	A181607-06	Solid	04/12/2018	04/17/2018
TS-SB-01 (5-8 WM) (10427291007)	A181607-07	Solid	04/12/2018	04/17/2018
TS-SB-02 (5-10 S) (10427291008)	A181607-08	Solid	04/12/2018	04/17/2018
TS-SB-03 (1.5-3.0 S) (10427291009)	A181607-09	Solid	04/12/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

9 samples were received on 04/17/2018. Samples were received at 4.4 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427291 Project Manager: Jennifer Anderson
--	--

FB-SB-G1 (5-10 S) (10427291002)
A181607-02 (Solid)

Date Sampled
 04/12/2018 10:45

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 06:39	EPA 8321B	

<i>Surrogate: DCAA</i>		96.1 %	70.8-116		04/20/2018	04/21/2018 06:39	EPA 8321B
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Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	89.4	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

FD-TT-05 (4-9 WM) (10427291003)
A181607-03 (Solid)

Date Sampled
 04/12/2018 09:45

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:16	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 07:46	EPA 8321B	
Surrogate: DCAA		82.7 %		70.8-116	04/20/2018	04/21/2018 07:46	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	75.5	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

FD-TT-06 (2-5 WM) (10427291004)
A181607-04 (Solid)

Date Sampled
 04/12/2018 11:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:22	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:22	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 08:53	EPA 8321B	
Surrogate: DCAA		77.4 %	70.8-116		04/20/2018	04/21/2018 08:53	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	64.4	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427291 Project Manager: Jennifer Anderson
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FD-TT-08 (5-12 WM) (10427291006)

A181607-06 (Solid)

Date Sampled
04/12/2018 14:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 10:34	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 10:34	EPA 8321B	
2,4,5-T	0.16	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 10:34	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
MCPA	0.13	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 11:08	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/21/2018 10:34	EPA 8321B	

Surrogate: DCAA 80.7 % 70.8-116 04/20/2018 04/21/2018 11:08 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	79.0	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

TS-SB-03 (1.5-3.0 S) (10427291009)
A181607-09 (Solid)

Date Sampled
 04/12/2018 19:55

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804171

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
2,4,5-TP	0.15	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:17	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:36	EPA 8321B	
Triclopyr	0.11	0.10	mg/kg dry	1	04/20/2018	04/20/2018 20:17	EPA 8321B	
<i>Surrogate: DCAA</i>		<i>100 %</i>	<i>70.8-116</i>		<i>04/20/2018</i>	<i>04/20/2018 20:36</i>	<i>EPA 8321B</i>	

Classical Chemistry Parameters

Preparation Batch: A804163

% Solids	90.3	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427291
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

Blank (A804171-BLK1)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 18:21										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	21.2		mg/kg wet	20.00		106	70.8-116			
Surrogate: DCAA [2C]	19.0		mg/kg wet	20.00		95.3	62.3-114			

LCS (A804171-BS1)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 17:14										
2,4-D	1.92	0.10	mg/kg wet	2.000		96.2	81.6-107			
2,4-D [2C]	1.66	0.10	mg/kg wet	2.000		83.2	71.8-120			
2,4-DB	1.77	0.10	mg/kg wet	2.000		88.7	76.4-107			
2,4-DB [2C]	1.69	0.10	mg/kg wet	2.000		84.5	62.2-129			
2,4,5-T	1.93	0.10	mg/kg wet	2.000		96.6	81.2-110			
2,4,5-T [2C]	1.88	0.10	mg/kg wet	2.000		93.8	70.6-125			
2,4,5-TP	1.87	0.10	mg/kg wet	2.000		93.5	79.1-106			
2,4,5-TP [2C]	1.69	0.10	mg/kg wet	2.000		84.4	68.2-118			
Bentazon	1.07	0.10	mg/kg wet	1.000		107	82.5-119			
Bentazon [2C]	0.806	0.10	mg/kg wet	1.000		80.6	73.3-125			
Dicamba	1.98	0.10	mg/kg wet	2.000		98.8	85.1-108			
Dicamba [2C]	1.85	0.10	mg/kg wet	2.000		92.4	71.4-115			
Picloram	0.991	0.10	mg/kg wet	1.000		99.1	86.1-106			
Picloram [2C]	0.878	0.10	mg/kg wet	1.000		87.8	74.5-114			
Triclopyr	1.89	0.10	mg/kg wet	2.000		94.4	78.6-106			
Triclopyr [2C]	1.67	0.10	mg/kg wet	2.000		83.4	69.4-118			
Surrogate: DCAA	20.9		mg/kg wet	20.00		105	70.8-116			
Surrogate: DCAA [2C]	18.7		mg/kg wet	20.00		93.5	62.3-114			

LCS (A804171-BS2)										
Prepared: 04/20/2018 Analyzed: 04/20/2018 16:07										
MCPA	2.15	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	1.92	0.10	mg/kg wet	2.000		96.2	77-123			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427291
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

LCS (A804171-BS2)

Prepared: 04/20/2018 Analyzed: 04/20/2018 16:07

Surrogate: DCAA	21.1		mg/kg wet	20.00		106	70.8-116			
Surrogate: DCAA [2C]	21.1		mg/kg wet	20.00		105	62.3-114			

Matrix Spike (A804171-MS1)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/20/2018 22:50

2,4-D	1.92	0.10	mg/kg dry	2.156	ND	89.2	71.4-105			
2,4-D [2C]	1.82	0.10	mg/kg dry	2.156	0.0525	81.8	50.5-123			
2,4-DB	1.86	0.10	mg/kg dry	2.156	ND	86.1	46.4-117			
2,4-DB [2C]	1.72	0.10	mg/kg dry	2.156	ND	79.7	44.5-121			
2,4,5-T	2.03	0.10	mg/kg dry	2.156	ND	94.1	66.2-110			
2,4,5-T [2C]	1.94	0.10	mg/kg dry	2.156	ND	90.0	43.6-126			
2,4,5-TP	1.97	0.10	mg/kg dry	2.156	ND	91.3	52.4-114			
2,4,5-TP [2C]	1.83	0.10	mg/kg dry	2.156	ND	85.0	47.6-117			
Bentazon	1.02	0.10	mg/kg dry	1.078	0.0456	90.9	61.5-117			
Bentazon [2C]	0.920	0.10	mg/kg dry	1.078	ND	85.3	50.7-127			
Dicamba	1.59	0.10	mg/kg dry	2.156	ND	73.9	48.4-111			
Dicamba [2C]	1.56	0.10	mg/kg dry	2.156	ND	72.3	43.3-108			
Picloram	0.633	0.10	mg/kg dry	1.078	ND	58.7	26.7-110			
Picloram [2C]	0.389	0.10	mg/kg dry	1.078	0.0164	34.6	10.8-110			
Triclopyr	1.95	0.10	mg/kg dry	2.156	ND	90.7	56-113			
Triclopyr [2C]	1.78	0.10	mg/kg dry	2.156	0.0278	81.2	47.9-120			
Surrogate: DCAA	21.4		mg/kg dry	21.56		99.2	70.8-116			
Surrogate: DCAA [2C]	19.1		mg/kg dry	21.56		88.6	62.3-114			

Matrix Spike (A804171-MS2)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/21/2018 01:04

MCPA	2.22	0.10	mg/kg dry	2.156	ND	103	74.2-114			
MCPA [2C]	2.11	0.10	mg/kg dry	2.156	ND	97.8	60.9-122			
Surrogate: DCAA	21.5		mg/kg dry	21.56		99.6	70.8-116			
Surrogate: DCAA [2C]	21.8		mg/kg dry	21.56		101	62.3-114			

Matrix Spike Dup (A804171-MSD1)

Source: A181607-08

Prepared: 04/20/2018 Analyzed: 04/20/2018 23:57

2,4-D	1.96	0.10	mg/kg dry	2.156	ND	90.7	71.4-105	1.67	20	
2,4-D [2C]	1.88	0.10	mg/kg dry	2.156	0.0525	84.8	50.5-123	3.52	20	
2,4-DB	1.86	0.10	mg/kg dry	2.156	ND	86.1	46.4-117	0.0708	20	
2,4-DB [2C]	1.81	0.10	mg/kg dry	2.156	ND	84.1	44.5-121	5.40	20	
2,4,5-T	2.01	0.10	mg/kg dry	2.156	ND	93.3	66.2-110	0.865	20	
2,4,5-T [2C]	1.92	0.10	mg/kg dry	2.156	ND	89.0	43.6-126	1.06	20	
2,4,5-TP	1.95	0.10	mg/kg dry	2.156	ND	90.3	52.4-114	1.05	20	
2,4,5-TP [2C]	1.83	0.10	mg/kg dry	2.156	ND	84.9	47.6-117	0.106	20	
Bentazon	1.04	0.10	mg/kg dry	1.078	0.0456	92.2	61.5-117	1.44	20	
Bentazon [2C]	0.960	0.10	mg/kg dry	1.078	ND	89.1	50.7-127	4.28	20	
Dicamba	1.62	0.10	mg/kg dry	2.156	ND	74.9	48.4-111	1.41	20	
Dicamba [2C]	1.60	0.10	mg/kg dry	2.156	ND	74.1	43.3-108	2.52	20	
Picloram	0.641	0.10	mg/kg dry	1.078	ND	59.5	26.7-110	1.30	20	
Picloram [2C]	0.387	0.10	mg/kg dry	1.078	0.0164	34.4	10.8-110	0.574	20	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427291
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804171 - EPA 3570

Matrix Spike Dup (A804171-MSD1)		Source: A181607-08		Prepared: 04/20/2018 Analyzed: 04/20/2018 23:57						
Triclopyr	1.97	0.10	mg/kg dry	2.156	ND	91.4	56-113	0.809	20	
Triclopyr [2C]	1.78	0.10	mg/kg dry	2.156	0.0278	81.1	47.9-120	0.221	20	
Surrogate: DCAA	21.2		mg/kg dry	21.56		98.4	70.8-116			
Surrogate: DCAA [2C]	18.9		mg/kg dry	21.56		87.9	62.3-114			
Matrix Spike Dup (A804171-MSD2)		Source: A181607-08		Prepared: 04/20/2018 Analyzed: 04/21/2018 02:11						
MCPA	2.21	0.10	mg/kg dry	2.156	ND	103	74.2-114	0.307	20	
MCPA [2C]	2.08	0.10	mg/kg dry	2.156	ND	96.5	60.9-122	1.37	20	
Surrogate: DCAA	21.6		mg/kg dry	21.56		100	70.8-116			
Surrogate: DCAA [2C]	21.9		mg/kg dry	21.56		102	62.3-114			



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 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804163 - % Solids

Duplicate (A804163-DUP1)	Source: A181607-09	Prepared: 04/18/2018	Analyzed: 04/19/2018 11:20		
% Solids	90.0	0.00 % by Weight	90.3	0.390	20



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

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1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427291
Project Manager: Jennifer Anderson

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- P The difference in the concentrations between the primary and confirmation column was > 40%.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

May 01, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10427354

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Alaska Certification UST-107

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807

Montana DHHS Certification #: CERT0102

Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1

Wisconsin DNR Certification #: 999446800

North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427354001	TS-SB-04 (7-15 WM)	Solid	04/13/18 09:00	04/13/18 16:30
10427354002	TS-SB-05 (5-7.5 WM)	Solid	04/13/18 10:10	04/13/18 16:30
10427354003	TS-SB-06 (8-12.5WM)	Solid	04/13/18 11:05	04/13/18 16:30
10427354004	TS-SB-07 (15.18.5)	Solid	04/13/18 12:20	04/13/18 16:30
10427354005	TS-SB-08 (10-20WM)	Solid	04/13/18 14:10	04/13/18 16:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427354001	TS-SB-04 (7-15 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	IP	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	BT	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427354002	TS-SB-05 (5-7.5 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	IP			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	BT			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427354003	TS-SB-06 (8-12.5WM)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	BT	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427354004	TS-SB-07 (15.18.5)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	BT	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427354005	TS-SB-08 (10-20WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	IP	11	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	BT	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) **Lab ID: 10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.3	1	04/25/18 10:56	04/30/18 14:26	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	309-00-2	
alpha-BHC	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	319-84-6	
beta-BHC	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	319-85-7	
delta-BHC	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	58-89-9	
Chlordane (Technical)	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	57-74-9	
alpha-Chlordane	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	5103-71-9	
gamma-Chlordane	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	5103-74-2	
4,4'-DDD	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	72-54-8	
4,4'-DDE	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	72-55-9	
4,4'-DDT	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	50-29-3	
Dieldrin	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	60-57-1	
Endosulfan I	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	959-98-8	
Endosulfan II	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	33213-65-9	
Endosulfan sulfate	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	1031-07-8	
Endrin	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	72-20-8	
Endrin aldehyde	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	7421-93-4	
Endrin ketone	ND	ug/kg	188	50	04/16/18 14:37	04/20/18 08:21	53494-70-5	
Heptachlor	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	76-44-8	
Heptachlor epoxide	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	1024-57-3	
Methoxychlor	ND	ug/kg	94.0	50	04/16/18 14:37	04/20/18 08:21	72-43-5	
Toxaphene	ND	ug/kg	2820	50	04/16/18 14:37	04/20/18 08:21	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	04/16/18 14:37	04/20/18 08:21	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	50	04/16/18 14:37	04/20/18 08:21	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11097-69-1	
PCB-1260 (Aroclor 1260)	150	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	11100-14-4	
PCB, Total	150	ug/kg	37.1	1	04/16/18 15:03	04/18/18 02:02	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	65	%	48-125	1	04/16/18 15:03	04/18/18 02:02	877-09-8	
Decachlorobiphenyl (S)	68	%	30-134	1	04/16/18 15:03	04/18/18 02:02	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) **Lab ID: 10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO						
WDRO C10-C28	371	mg/kg	193	20	04/16/18 14:24	04/19/18 17:44		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/16/18 14:24	04/19/18 17:44	638-68-6	S4
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil						
Gasoline Range Organics	ND	mg/kg	11.9	1	04/25/18 10:39	04/25/18 18:33		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/25/18 10:39	04/25/18 18:33	98-08-8	
6010C MET ICP		Analytical Method: EPA 6010C Preparation Method: EPA 3050						
Aluminum	3310	mg/kg	11.0	1	04/17/18 04:48	04/17/18 19:26	7429-90-5	
Barium	47.3	mg/kg	0.55	1	04/17/18 04:48	04/17/18 19:26	7440-39-3	
Boron	ND	mg/kg	8.2	1	04/17/18 04:48	04/17/18 19:26	7440-42-8	
Copper	8.8	mg/kg	0.55	1	04/17/18 04:48	04/17/18 19:26	7440-50-8	
Iron	7490	mg/kg	2.7	1	04/17/18 04:48	04/17/18 19:26	7439-89-6	
Manganese	318	mg/kg	0.27	1	04/17/18 04:48	04/17/18 19:26	7439-96-5	
Nickel	8.0	mg/kg	1.1	1	04/17/18 04:48	04/17/18 19:26	7440-02-0	
Silver	ND	mg/kg	0.55	1	04/17/18 04:48	04/17/18 19:26	7440-22-4	
Tin	ND	mg/kg	4.1	1	04/17/18 04:48	04/17/18 19:26	7440-31-5	
Titanium	208	mg/kg	1.4	1	04/17/18 04:48	04/17/18 19:26	7440-32-6	
Zinc	58.5	mg/kg	1.1	1	04/17/18 04:48	04/17/18 19:26	7440-66-6	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3050B						
Chromium	12.0	mg/kg	1.1	5	04/20/18 09:20	04/21/18 02:34	7440-47-3	N2
6020A MET ICPMS		Analytical Method: EPA 6020A Preparation Method: EPA 3050						
Antimony	ND	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7440-36-0	
Arsenic	3.9	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7440-38-2	
Beryllium	ND	mg/kg	0.22	20	04/17/18 05:10	04/17/18 12:24	7440-41-7	
Cadmium	0.14	mg/kg	0.089	20	04/17/18 05:10	04/17/18 12:24	7440-43-9	
Cobalt	4.6	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7440-48-4	
Lead	14.2	mg/kg	0.11	20	04/17/18 05:10	04/17/18 12:24	7439-92-1	
Lithium	4.8	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7439-93-2	
Selenium	ND	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7782-49-2	
Strontium	24.9	mg/kg	0.56	20	04/17/18 05:10	04/17/18 12:24	7440-24-6	
Vanadium	19.3	mg/kg	1.1	20	04/17/18 05:10	04/17/18 12:24	7440-62-2	
7471 Mercury		Analytical Method: EPA 7471 Preparation Method: EPA 7471						
Mercury	0.14	mg/kg	0.022	1	04/23/18 05:40	04/23/18 15:18	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974						
Percent Moisture	11.4	%	0.10	1		04/19/18 11:01		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) Lab ID: 10427354001 Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	208-96-8	
Anthracene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	120-12-7	
Benzo(a)anthracene	527	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	56-55-3	
Benzo(a)pyrene	423	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	50-32-8	
Benzo(b)fluoranthene	497	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	101-55-3	
Butylbenzylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	85-68-7	
Carbazole	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	59-50-7	
4-Chloroaniline	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	108-60-1	
2-Chloronaphthalene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	91-58-7	
2-Chlorophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	7005-72-3	
Chrysene	727	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	53-70-3	
Dibenzofuran	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	120-83-2	
Diethylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	105-67-9	
Dimethylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	131-11-3	
Di-n-butylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1910	1	04/19/18 17:13	04/20/18 17:00	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	606-20-2	
Di-n-octylphthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	117-81-7	
Fluoranthene	997	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	206-44-0	
Fluorene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	87-68-3	
Hexachlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	118-74-1	
Hexachloroethane	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	193-39-5	
Isophorone	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	78-59-1	
1-Methylnaphthalene	607	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	90-12-0	
2-Methylnaphthalene	826	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) **Lab ID: 10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	743	1	04/19/18 17:13	04/20/18 17:00		
Naphthalene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	91-20-3	
2-Nitroaniline	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	88-74-4	
3-Nitroaniline	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	99-09-2	
4-Nitroaniline	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	100-01-6	
Nitrobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	98-95-3	
2-Nitrophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	88-75-5	
4-Nitrophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	86-30-6	
Pentachlorophenol	ND	ug/kg	754	1	04/19/18 17:13	04/20/18 17:00	87-86-5	
Phenanthrene	1440	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	85-01-8	
Phenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	108-95-2	
Pyrene	1320	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	371	1	04/19/18 17:13	04/20/18 17:00	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	73	%	43-125	1	04/19/18 17:13	04/20/18 17:00	4165-60-0	
2-Fluorobiphenyl (S)	81	%	30-132	1	04/19/18 17:13	04/20/18 17:00	321-60-8	
p-Terphenyl-d14 (S)	81	%	62-125	1	04/19/18 17:13	04/20/18 17:00	1718-51-0	
Phenol-d6 (S)	79	%	48-125	1	04/19/18 17:13	04/20/18 17:00	13127-88-3	
2-Fluorophenol (S)	77	%	40-125	1	04/19/18 17:13	04/20/18 17:00	367-12-4	
2,4,6-Tribromophenol (S)	71	%	60-125	1	04/19/18 17:13	04/20/18 17:00	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	83-32-9	
Acenaphthylene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	208-96-8	
Anthracene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	120-12-7	
Benzo(a)anthracene	132	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	56-55-3	
Benzo(a)pyrene	124	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	50-32-8	
Benzo(b)fluoranthene	167	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	205-99-2	
Benzo(g,h,i)perylene	82.4	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	191-24-2	
Benzo(k)fluoranthene	69.8	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	207-08-9	
Chrysene	138	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	53-70-3	
Fluoranthene	293	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	206-44-0	
Fluorene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	86-73-7	
Indeno(1,2,3-cd)pyrene	71.6	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	193-39-5	
Naphthalene	ND	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	91-20-3	
Phenanthrene	239	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	85-01-8	
Pyrene	257	ug/kg	56.4	5	04/17/18 12:13	04/18/18 21:02	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	81	%	42-125	5	04/17/18 12:13	04/18/18 21:02	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) **Lab ID: 10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Surrogates

p-Terphenyl-d14 (S)	96	%	57-125	5	04/17/18 12:13	04/18/18 21:02	1718-51-0	
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8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	ND	ug/kg	1160	1	04/24/18 16:08	04/25/18 03:48	67-64-1	
Allyl chloride	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	107-05-1	
Benzene	ND	ug/kg	23.2	1	04/24/18 16:08	04/25/18 03:48	71-43-2	
Bromobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	108-86-1	
Bromochloromethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	74-97-5	
Bromodichloromethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	75-27-4	
Bromoform	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	75-25-2	
Bromomethane	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	74-83-9	
2-Butanone (MEK)	ND	ug/kg	290	1	04/24/18 16:08	04/25/18 03:48	78-93-3	
n-Butylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	104-51-8	
sec-Butylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	135-98-8	
tert-Butylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	98-06-6	
Carbon tetrachloride	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	56-23-5	
Chlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	108-90-7	
Chloroethane	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	75-00-3	
Chloroform	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	67-66-3	
Chloromethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	74-87-3	
2-Chlorotoluene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	95-49-8	
4-Chlorotoluene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	96-12-8	
Dibromochloromethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	106-93-4	
Dibromomethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	75-71-8	
1,1-Dichloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	75-34-3	
1,2-Dichloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	107-06-2	
1,1-Dichloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	156-60-5	
Dichlorofluoromethane	ND	ug/kg	580	1	04/24/18 16:08	04/25/18 03:48	75-43-4	
1,2-Dichloropropane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	78-87-5	
1,3-Dichloropropane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	142-28-9	
2,2-Dichloropropane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	594-20-7	
1,1-Dichloropropene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	60-29-7	
Ethylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	290	1	04/24/18 16:08	04/25/18 03:48	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-04 (7-15 WM) **Lab ID: 10427354001** Collected: 04/13/18 09:00 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	98-82-8	
p-Isopropyltoluene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	99-87-6	
Methylene Chloride	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	290	1	04/24/18 16:08	04/25/18 03:48	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	1634-04-4	
Naphthalene	448	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	91-20-3	
n-Propylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	103-65-1	
Styrene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	79-34-5	
Tetrachloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	127-18-4	
Tetrahydrofuran	ND	ug/kg	2320	1	04/24/18 16:08	04/25/18 03:48	109-99-9	
Toluene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	79-00-5	
Trichloroethene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	79-01-6	
Trichlorofluoromethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	232	1	04/24/18 16:08	04/25/18 03:48	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	58.0	1	04/24/18 16:08	04/25/18 03:48	108-67-8	
Vinyl chloride	ND	ug/kg	23.2	1	04/24/18 16:08	04/25/18 03:48	75-01-4	
Xylene (Total)	ND	ug/kg	174	1	04/24/18 16:08	04/25/18 03:48	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/24/18 16:08	04/25/18 03:48	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/24/18 16:08	04/25/18 03:48	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125	1	04/24/18 16:08	04/25/18 03:48	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	11.1	5	04/23/18 11:09	04/24/18 13:26	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	12.0	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.37	1	04/20/18 10:25	04/20/18 13:49	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	2.8	mg/kg	0.99	1	04/18/18 14:45	04/19/18 18:11	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-05 (5-7.5 WM)** Lab ID: **10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	13.8	1	04/25/18 10:56	04/27/18 17:27	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	309-00-2	
alpha-BHC	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	319-84-6	
beta-BHC	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	319-85-7	
delta-BHC	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	58-89-9	
Chlordane (Technical)	ND	ug/kg	490	20	04/16/18 14:37	04/20/18 08:39	57-74-9	
alpha-Chlordane	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	5103-71-9	
gamma-Chlordane	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	5103-74-2	
4,4'-DDD	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	72-54-8	
4,4'-DDE	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	72-55-9	
4,4'-DDT	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	50-29-3	
Dieldrin	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	60-57-1	
Endosulfan I	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	959-98-8	
Endosulfan II	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	33213-65-9	
Endosulfan sulfate	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	1031-07-8	
Endrin	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	72-20-8	
Endrin aldehyde	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	7421-93-4	
Endrin ketone	ND	ug/kg	97.7	20	04/16/18 14:37	04/20/18 08:39	53494-70-5	
Heptachlor	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	76-44-8	
Heptachlor epoxide	ND	ug/kg	49.0	20	04/16/18 14:37	04/20/18 08:39	1024-57-3	
Methoxychlor	ND	ug/kg	490	20	04/16/18 14:37	04/20/18 08:39	72-43-5	
Toxaphene	ND	ug/kg	1470	20	04/16/18 14:37	04/20/18 08:39	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/16/18 14:37	04/20/18 08:39	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/16/18 14:37	04/20/18 08:39	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	11100-14-4	
PCB, Total	ND	ug/kg	48.4	1	04/16/18 15:03	04/18/18 02:50	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	74	%	48-125	1	04/16/18 15:03	04/18/18 02:50	877-09-8	
Decachlorobiphenyl (S)	62	%	30-134	1	04/16/18 15:03	04/18/18 02:50	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1150	mg/kg	532	10	04/16/18 14:24	04/19/18 17:58		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/16/18 14:24	04/19/18 17:58	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	38.9	mg/kg	19.1	1	04/25/18 10:39	04/25/18 16:31		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/25/18 10:39	04/25/18 16:31	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4730	mg/kg	14.7	1	04/17/18 04:48	04/17/18 19:30	7429-90-5	
Barium	174	mg/kg	0.73	1	04/17/18 04:48	04/17/18 19:30	7440-39-3	
Boron	18.4	mg/kg	11.0	1	04/17/18 04:48	04/17/18 19:30	7440-42-8	
Copper	18.2	mg/kg	0.73	1	04/17/18 04:48	04/17/18 19:30	7440-50-8	
Iron	27600	mg/kg	18.4	5	04/17/18 04:48	04/18/18 11:36	7439-89-6	
Manganese	723	mg/kg	0.37	1	04/17/18 04:48	04/17/18 19:30	7439-96-5	
Nickel	11.3	mg/kg	1.5	1	04/17/18 04:48	04/17/18 19:30	7440-02-0	
Silver	ND	mg/kg	0.73	1	04/17/18 04:48	04/17/18 19:30	7440-22-4	
Tin	10.5	mg/kg	5.5	1	04/17/18 04:48	04/17/18 19:30	7440-31-5	
Titanium	172	mg/kg	1.8	1	04/17/18 04:48	04/17/18 19:30	7440-32-6	
Zinc	999	mg/kg	1.5	1	04/17/18 04:48	04/17/18 19:30	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	38.2	mg/kg	1.4	5	04/20/18 09:20	04/21/18 02:38	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	0.78	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7440-36-0	
Arsenic	11.4	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7440-38-2	
Beryllium	0.31	mg/kg	0.29	20	04/17/18 05:10	04/17/18 12:27	7440-41-7	
Cadmium	3.4	mg/kg	0.12	20	04/17/18 05:10	04/17/18 12:27	7440-43-9	
Cobalt	5.2	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7440-48-4	
Lead	579	mg/kg	0.15	20	04/17/18 05:10	04/17/18 12:27	7439-92-1	
Lithium	5.6	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7439-93-2	
Selenium	ND	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7782-49-2	
Strontium	72.7	mg/kg	0.73	20	04/17/18 05:10	04/17/18 12:27	7440-24-6	
Vanadium	19.5	mg/kg	1.5	20	04/17/18 05:10	04/17/18 12:27	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.14	mg/kg	0.027	1	04/23/18 05:40	04/23/18 15:20	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	31.9	%	0.10	1		04/19/18 11:02		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-05 (5-7.5 WM)** Lab ID: **10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	208-96-8	
Anthracene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	120-12-7	
Benzo(a)anthracene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	56-55-3	
Benzo(a)pyrene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	101-55-3	
Butylbenzylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	85-68-7	
Carbazole	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	59-50-7	
4-Chloroaniline	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	108-60-1	
2-Chloronaphthalene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	91-58-7	
2-Chlorophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	7005-72-3	
Chrysene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	53-70-3	
Dibenzofuran	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	120-83-2	
Diethylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	105-67-9	
Dimethylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	131-11-3	
Di-n-butylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2490	1	04/19/18 17:13	04/20/18 23:25	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	606-20-2	
Di-n-octylphthalate	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	122-66-7	
bis(2-Ethylhexyl)phthalate	6560	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	117-81-7	
Fluoranthene	718	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	206-44-0	
Fluorene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	87-68-3	
Hexachlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	118-74-1	
Hexachloroethane	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	193-39-5	
Isophorone	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	78-59-1	
1-Methylnaphthalene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	90-12-0	
2-Methylnaphthalene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	966	1	04/19/18 17:13	04/20/18 23:25		
Naphthalene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	91-20-3	
2-Nitroaniline	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	88-74-4	
3-Nitroaniline	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	99-09-2	
4-Nitroaniline	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	100-01-6	
Nitrobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	98-95-3	
2-Nitrophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	88-75-5	
4-Nitrophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	86-30-6	
Pentachlorophenol	ND	ug/kg	981	1	04/19/18 17:13	04/20/18 23:25	87-86-5	
Phenanthrene	815	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	85-01-8	
Phenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	108-95-2	
Pyrene	618	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	483	1	04/19/18 17:13	04/20/18 23:25	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	48	%	43-125	1	04/19/18 17:13	04/20/18 23:25	4165-60-0	
2-Fluorobiphenyl (S)	66	%	30-132	1	04/19/18 17:13	04/20/18 23:25	321-60-8	
p-Terphenyl-d14 (S)	65	%	62-125	1	04/19/18 17:13	04/20/18 23:25	1718-51-0	
Phenol-d6 (S)	52	%	48-125	1	04/19/18 17:13	04/20/18 23:25	13127-88-3	
2-Fluorophenol (S)	53	%	40-125	1	04/19/18 17:13	04/20/18 23:25	367-12-4	
2,4,6-Tribromophenol (S)	59	%	60-125	1	04/19/18 17:13	04/20/18 23:25	118-79-6	S5

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	167	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	83-32-9	
Acenaphthylene	ND	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	208-96-8	
Anthracene	217	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	120-12-7	
Benzo(a)anthracene	373	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	56-55-3	
Benzo(a)pyrene	307	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	50-32-8	
Benzo(b)fluoranthene	398	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	205-99-2	
Benzo(g,h,i)perylene	190	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	191-24-2	
Benzo(k)fluoranthene	112	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	207-08-9	
Chrysene	356	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	53-70-3	
Fluoranthene	872	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	206-44-0	
Fluorene	354	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	86-73-7	
Indeno(1,2,3-cd)pyrene	153	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	193-39-5	
Naphthalene	825	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	91-20-3	
Phenanthrene	1100	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	85-01-8	
Pyrene	781	ug/kg	73.2	5	04/17/18 12:13	04/18/18 21:43	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	71	%	42-125	5	04/17/18 12:13	04/18/18 21:43	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	78	%	57-125	5	04/17/18 12:13	04/18/18 21:43	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1960	1	04/24/18 16:08	04/25/18 04:05	67-64-1	
Allyl chloride	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	107-05-1	
Benzene	58.1	ug/kg	39.2	1	04/24/18 16:08	04/25/18 04:05	71-43-2	
Bromobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	108-86-1	
Bromochloromethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	74-97-5	
Bromodichloromethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	75-27-4	
Bromoform	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	75-25-2	
Bromomethane	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	74-83-9	
2-Butanone (MEK)	ND	ug/kg	490	1	04/24/18 16:08	04/25/18 04:05	78-93-3	
n-Butylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	104-51-8	
sec-Butylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	135-98-8	
tert-Butylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	98-06-6	
Carbon tetrachloride	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	56-23-5	
Chlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	108-90-7	
Chloroethane	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	75-00-3	
Chloroform	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	67-66-3	
Chloromethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	74-87-3	
2-Chlorotoluene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	95-49-8	
4-Chlorotoluene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	96-12-8	
Dibromochloromethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	106-93-4	
Dibromomethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	75-71-8	
1,1-Dichloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	75-34-3	
1,2-Dichloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	107-06-2	
1,1-Dichloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	156-60-5	
Dichlorofluoromethane	ND	ug/kg	980	1	04/24/18 16:08	04/25/18 04:05	75-43-4	
1,2-Dichloropropane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	78-87-5	
1,3-Dichloropropane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	142-28-9	
2,2-Dichloropropane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	594-20-7	
1,1-Dichloropropene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	60-29-7	
Ethylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	490	1	04/24/18 16:08	04/25/18 04:05	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-05 (5-7.5 WM) **Lab ID: 10427354002** Collected: 04/13/18 10:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	106	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	98-82-8	
p-Isopropyltoluene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	99-87-6	
Methylene Chloride	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	490	1	04/24/18 16:08	04/25/18 04:05	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	1634-04-4	
Naphthalene	493	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	91-20-3	
n-Propylbenzene	117	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	103-65-1	
Styrene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	630-20-6	
1,1,2,2-Tetrachloroethane	138	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	79-34-5	
Tetrachloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	127-18-4	
Tetrahydrofuran	ND	ug/kg	3920	1	04/24/18 16:08	04/25/18 04:05	109-99-9	
Toluene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	79-00-5	
Trichloroethene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	79-01-6	
Trichlorofluoromethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	392	1	04/24/18 16:08	04/25/18 04:05	76-13-1	
1,2,4-Trimethylbenzene	386	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	98.0	1	04/24/18 16:08	04/25/18 04:05	108-67-8	
Vinyl chloride	ND	ug/kg	39.2	1	04/24/18 16:08	04/25/18 04:05	75-01-4	
Xylene (Total)	ND	ug/kg	294	1	04/24/18 16:08	04/25/18 04:05	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/24/18 16:08	04/25/18 04:05	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/24/18 16:08	04/25/18 04:05	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/24/18 16:08	04/25/18 04:05	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	57.1	20	04/23/18 11:09	04/24/18 13:27	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	38.2	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.38	1	04/20/18 10:25	04/20/18 13:52	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	4.1	mg/kg	0.99	1	04/18/18 14:45	04/19/18 19:49	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) **Lab ID: 10427354003** Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.3	1	04/25/18 10:56	04/27/18 17:34	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	309-00-2	
alpha-BHC	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	319-84-6	
beta-BHC	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	319-85-7	
delta-BHC	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	58-89-9	
Chlordane (Technical)	ND	ug/kg	420	20	04/16/18 14:37	04/20/18 08:57	57-74-9	
alpha-Chlordane	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	5103-71-9	
gamma-Chlordane	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	5103-74-2	
4,4'-DDD	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	72-54-8	
4,4'-DDE	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	72-55-9	
4,4'-DDT	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	50-29-3	
Dieldrin	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	60-57-1	
Endosulfan I	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	959-98-8	
Endosulfan II	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	33213-65-9	
Endosulfan sulfate	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	1031-07-8	
Endrin	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	72-20-8	
Endrin aldehyde	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	7421-93-4	
Endrin ketone	ND	ug/kg	83.7	20	04/16/18 14:37	04/20/18 08:57	53494-70-5	
Heptachlor	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	76-44-8	
Heptachlor epoxide	ND	ug/kg	42.0	20	04/16/18 14:37	04/20/18 08:57	1024-57-3	
Methoxychlor	ND	ug/kg	420	20	04/16/18 14:37	04/20/18 08:57	72-43-5	
Toxaphene	ND	ug/kg	1260	20	04/16/18 14:37	04/20/18 08:57	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/16/18 14:37	04/20/18 08:57	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/16/18 14:37	04/20/18 08:57	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	12672-29-6	
PCB-1254 (Aroclor 1254)	94.1	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	11100-14-4	
PCB, Total	94.1	ug/kg	41.3	1	04/16/18 15:03	04/18/18 03:06	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	75	%	48-125	1	04/16/18 15:03	04/18/18 03:06	877-09-8	
Decachlorobiphenyl (S)	66	%	30-134	1	04/16/18 15:03	04/18/18 03:06	2051-24-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) Lab ID: 10427354003 Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3820	mg/kg	614	50	04/16/18 14:24	04/20/18 09:34		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	50	04/16/18 14:24	04/20/18 09:34	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.4	1	04/25/18 10:39	04/25/18 16:55		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/25/18 10:39	04/25/18 16:55	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8830	mg/kg	11.9	1	04/17/18 04:48	04/17/18 19:33	7429-90-5	
Barium	118	mg/kg	0.59	1	04/17/18 04:48	04/17/18 19:33	7440-39-3	
Boron	23.6	mg/kg	8.9	1	04/17/18 04:48	04/17/18 19:33	7440-42-8	
Copper	341	mg/kg	0.59	1	04/17/18 04:48	04/17/18 19:33	7440-50-8	
Iron	11500	mg/kg	3.0	1	04/17/18 04:48	04/17/18 19:33	7439-89-6	
Manganese	247	mg/kg	0.30	1	04/17/18 04:48	04/17/18 19:33	7439-96-5	
Nickel	21.2	mg/kg	1.2	1	04/17/18 04:48	04/17/18 19:33	7440-02-0	
Silver	ND	mg/kg	0.59	1	04/17/18 04:48	04/17/18 19:33	7440-22-4	
Tin	ND	mg/kg	4.5	1	04/17/18 04:48	04/17/18 19:33	7440-31-5	
Titanium	228	mg/kg	1.5	1	04/17/18 04:48	04/17/18 19:33	7440-32-6	
Zinc	519	mg/kg	1.2	1	04/17/18 04:48	04/17/18 19:33	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	24.3	mg/kg	1.2	5	04/20/18 09:20	04/21/18 02:52	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.1	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7440-36-0	
Arsenic	5.5	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7440-38-2	
Beryllium	ND	mg/kg	0.24	20	04/17/18 05:10	04/17/18 12:30	7440-41-7	
Cadmium	1.3	mg/kg	0.094	20	04/17/18 05:10	04/17/18 12:30	7440-43-9	
Cobalt	4.0	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7440-48-4	
Lead	436	mg/kg	0.12	20	04/17/18 05:10	04/17/18 12:30	7439-92-1	
Lithium	3.5	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7439-93-2	
Selenium	ND	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7782-49-2	
Strontium	45.4	mg/kg	0.59	20	04/17/18 05:10	04/17/18 12:30	7440-24-6	
Vanadium	13.1	mg/kg	1.2	20	04/17/18 05:10	04/17/18 12:30	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.23	mg/kg	0.023	1	04/23/18 05:40	04/23/18 15:27	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	20.5	%	0.10	1		04/19/18 11:04		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) **Lab ID: 10427354003** Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	208-96-8	
Anthracene	5490	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	120-12-7	
Benzo(a)anthracene	13800	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	56-55-3	
Benzo(a)pyrene	12700	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	50-32-8	
Benzo(b)fluoranthene	18000	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	205-99-2	
Benzo(g,h,i)perylene	8300	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	191-24-2	
Benzo(k)fluoranthene	6380	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	101-55-3	
Butylbenzylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	85-68-7	
Carbazole	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	59-50-7	
4-Chloroaniline	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	108-60-1	
2-Chloronaphthalene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	91-58-7	
2-Chlorophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	7005-72-3	
Chrysene	14800	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	53-70-3	
Dibenzofuran	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	120-83-2	
Diethylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	105-67-9	
Dimethylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	131-11-3	
Di-n-butylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	21400	10	04/19/18 17:13	04/23/18 21:33	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	606-20-2	
Di-n-octylphthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	117-81-7	
Fluoranthene	31200	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	206-44-0	
Fluorene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	87-68-3	
Hexachlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	118-74-1	
Hexachloroethane	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	67-72-1	
Indeno(1,2,3-cd)pyrene	7520	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	193-39-5	
Isophorone	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	78-59-1	
1-Methylnaphthalene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	90-12-0	
2-Methylnaphthalene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-06 (8-12.5WM)** Lab ID: **10427354003** Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	8300	10	04/19/18 17:13	04/23/18 21:33		
Naphthalene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	91-20-3	
2-Nitroaniline	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	88-74-4	
3-Nitroaniline	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	99-09-2	
4-Nitroaniline	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	100-01-6	
Nitrobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	98-95-3	
2-Nitrophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	88-75-5	
4-Nitrophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	86-30-6	
Pentachlorophenol	ND	ug/kg	8420	10	04/19/18 17:13	04/23/18 21:33	87-86-5	
Phenanthrene	19500	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	85-01-8	
Phenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	108-95-2	
Pyrene	27200	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	4150	10	04/19/18 17:13	04/23/18 21:33	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	10	04/19/18 17:13	04/23/18 21:33	4165-60-0	S4
2-Fluorobiphenyl (S)	0	%	30-132	10	04/19/18 17:13	04/23/18 21:33	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	10	04/19/18 17:13	04/23/18 21:33	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	10	04/19/18 17:13	04/23/18 21:33	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	10	04/19/18 17:13	04/23/18 21:33	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	10	04/19/18 17:13	04/23/18 21:33	118-79-6	S4
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	367	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	83-32-9	
Acenaphthylene	ND	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	208-96-8	
Anthracene	1210	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	120-12-7	
Benzo(a)anthracene	3210	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	56-55-3	
Benzo(a)pyrene	3060	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	50-32-8	
Benzo(b)fluoranthene	3850	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	205-99-2	
Benzo(g,h,i)perylene	1690	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	191-24-2	
Benzo(k)fluoranthene	1390	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	207-08-9	
Chrysene	2910	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	218-01-9	
Dibenz(a,h)anthracene	511	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	53-70-3	
Fluoranthene	6940	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	206-44-0	
Fluorene	413	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	86-73-7	
Indeno(1,2,3-cd)pyrene	1550	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	193-39-5	
Naphthalene	ND	ug/kg	62.9	5	04/17/18 12:13	04/18/18 22:03	91-20-3	
Phenanthrene	4240	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	85-01-8	
Pyrene	5350	ug/kg	314	25	04/17/18 12:13	04/19/18 22:11	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	86	%	42-125	5	04/17/18 12:13	04/18/18 22:03	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) Lab ID: 10427354003 Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Surrogates

p-Terphenyl-d14 (S)	101	%	57-125	5	04/17/18 12:13	04/18/18 22:03	1718-51-0	
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8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	ND	ug/kg	1280	1	04/24/18 16:08	04/25/18 04:22	67-64-1	
Allyl chloride	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	107-05-1	
Benzene	ND	ug/kg	25.7	1	04/24/18 16:08	04/25/18 04:22	71-43-2	
Bromobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	108-86-1	
Bromochloromethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	74-97-5	
Bromodichloromethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	75-27-4	
Bromoform	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	75-25-2	
Bromomethane	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	74-83-9	
2-Butanone (MEK)	ND	ug/kg	321	1	04/24/18 16:08	04/25/18 04:22	78-93-3	
n-Butylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	104-51-8	
sec-Butylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	135-98-8	
tert-Butylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	98-06-6	
Carbon tetrachloride	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	56-23-5	
Chlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	108-90-7	
Chloroethane	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	75-00-3	
Chloroform	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	67-66-3	
Chloromethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	74-87-3	
2-Chlorotoluene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	95-49-8	
4-Chlorotoluene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	96-12-8	
Dibromochloromethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	106-93-4	
Dibromomethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	75-71-8	
1,1-Dichloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	75-34-3	
1,2-Dichloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	107-06-2	
1,1-Dichloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	156-60-5	
Dichlorofluoromethane	ND	ug/kg	642	1	04/24/18 16:08	04/25/18 04:22	75-43-4	
1,2-Dichloropropane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	78-87-5	
1,3-Dichloropropane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	142-28-9	
2,2-Dichloropropane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	594-20-7	
1,1-Dichloropropene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	60-29-7	
Ethylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	321	1	04/24/18 16:08	04/25/18 04:22	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-06 (8-12.5WM) Lab ID: 10427354003 Collected: 04/13/18 11:05 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	98-82-8	
p-Isopropyltoluene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	99-87-6	
Methylene Chloride	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	321	1	04/24/18 16:08	04/25/18 04:22	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	1634-04-4	
Naphthalene	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	91-20-3	
n-Propylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	103-65-1	
Styrene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	79-34-5	
Tetrachloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	127-18-4	
Tetrahydrofuran	ND	ug/kg	2570	1	04/24/18 16:08	04/25/18 04:22	109-99-9	
Toluene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	79-00-5	
Trichloroethene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	79-01-6	
Trichlorofluoromethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	257	1	04/24/18 16:08	04/25/18 04:22	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	64.2	1	04/24/18 16:08	04/25/18 04:22	108-67-8	
Vinyl chloride	ND	ug/kg	25.7	1	04/24/18 16:08	04/25/18 04:22	75-01-4	
Xylene (Total)	ND	ug/kg	193	1	04/24/18 16:08	04/25/18 04:22	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	75-125	1	04/24/18 16:08	04/25/18 04:22	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	04/24/18 16:08	04/25/18 04:22	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	04/24/18 16:08	04/25/18 04:22	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	48.4	20	04/23/18 11:09	04/24/18 13:27	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	24.3	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.30	1	04/20/18 10:25	04/20/18 13:52	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/18/18 14:45	04/19/18 18:31	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-07 (15.18.5) **Lab ID: 10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.58	1	04/25/18 10:56	04/27/18 17:40	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	309-00-2	
alpha-BHC	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	319-84-6	
beta-BHC	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	319-85-7	
delta-BHC	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	58-89-9	
Chlordane (Technical)	ND	ug/kg	35.9	2	04/16/18 14:37	04/20/18 01:56	57-74-9	
alpha-Chlordane	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	5103-71-9	
gamma-Chlordane	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	5103-74-2	
4,4'-DDD	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	72-54-8	
4,4'-DDE	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	72-55-9	
4,4'-DDT	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	50-29-3	
Dieldrin	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	60-57-1	
Endosulfan I	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	959-98-8	
Endosulfan II	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	33213-65-9	
Endosulfan sulfate	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	1031-07-8	
Endrin	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	72-20-8	
Endrin aldehyde	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	7421-93-4	
Endrin ketone	ND	ug/kg	7.2	2	04/16/18 14:37	04/20/18 01:56	53494-70-5	
Heptachlor	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	76-44-8	
Heptachlor epoxide	ND	ug/kg	3.6	2	04/16/18 14:37	04/20/18 01:56	1024-57-3	
Methoxychlor	ND	ug/kg	35.9	2	04/16/18 14:37	04/20/18 01:56	72-43-5	
Toxaphene	ND	ug/kg	108	2	04/16/18 14:37	04/20/18 01:56	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	95	%	30-150	2	04/16/18 14:37	04/20/18 01:56	877-09-8	5M, D3
Decachlorobiphenyl (S)	92	%	30-150	2	04/16/18 14:37	04/20/18 01:56	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	11100-14-4	
PCB, Total	ND	ug/kg	35.5	1	04/16/18 15:03	04/18/18 03:21	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	87	%	48-125	1	04/16/18 15:03	04/18/18 03:21	877-09-8	
Decachlorobiphenyl (S)	80	%	30-134	1	04/16/18 15:03	04/18/18 03:21	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WIDRO C10-C28	ND	mg/kg	7.2	1	04/16/18 14:24	04/19/18 19:45		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-07 (15.18.5) **Lab ID: 10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	92	%	50-150	1	04/16/18 14:24	04/19/18 19:45	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	11.2	1	04/25/18 10:39	04/25/18 17:19		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	04/25/18 10:39	04/25/18 17:19	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	2680	mg/kg	10.1	1	04/17/18 04:48	04/17/18 19:37	7429-90-5	
Barium	40.0	mg/kg	0.50	1	04/17/18 04:48	04/17/18 19:37	7440-39-3	
Boron	ND	mg/kg	7.6	1	04/17/18 04:48	04/17/18 19:37	7440-42-8	
Copper	6.3	mg/kg	0.50	1	04/17/18 04:48	04/17/18 19:37	7440-50-8	
Iron	7710	mg/kg	2.5	1	04/17/18 04:48	04/17/18 19:37	7439-89-6	
Manganese	300	mg/kg	0.25	1	04/17/18 04:48	04/17/18 19:37	7439-96-5	
Nickel	7.6	mg/kg	1.0	1	04/17/18 04:48	04/17/18 19:37	7440-02-0	
Silver	ND	mg/kg	0.50	1	04/17/18 04:48	04/17/18 19:37	7440-22-4	
Tin	ND	mg/kg	3.8	1	04/17/18 04:48	04/17/18 19:37	7440-31-5	
Titanium	182	mg/kg	1.3	1	04/17/18 04:48	04/17/18 19:37	7440-32-6	
Zinc	16.1	mg/kg	1.0	1	04/17/18 04:48	04/17/18 19:37	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	8.3	mg/kg	0.98	5	04/20/18 09:20	04/21/18 02:57	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7440-36-0	
Arsenic	2.1	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7440-38-2	
Beryllium	ND	mg/kg	0.21	20	04/17/18 05:10	04/17/18 12:32	7440-41-7	
Cadmium	0.12	mg/kg	0.085	20	04/17/18 05:10	04/17/18 12:32	7440-43-9	
Cobalt	3.4	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7440-48-4	
Lead	4.8	mg/kg	0.11	20	04/17/18 05:10	04/17/18 12:32	7439-92-1	
Lithium	4.5	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7439-93-2	
Selenium	ND	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7782-49-2	
Strontium	27.3	mg/kg	0.53	20	04/17/18 05:10	04/17/18 12:32	7440-24-6	
Vanadium	19.7	mg/kg	1.1	20	04/17/18 05:10	04/17/18 12:32	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND	mg/kg	0.020	1	04/23/18 05:40	04/23/18 15:29	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	7.2	%	0.10	1		04/19/18 11:05		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	83-32-9	
Acenaphthylene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-07 (15.18.5) **Lab ID: 10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	120-12-7	
Benzo(a)anthracene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	56-55-3	
Benzo(a)pyrene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	101-55-3	
Butylbenzylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	85-68-7	
Carbazole	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	59-50-7	
4-Chloroaniline	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	108-60-1	
2-Chloronaphthalene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	91-58-7	
2-Chlorophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	7005-72-3	
Chrysene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	53-70-3	
Dibenzofuran	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	120-83-2	
Diethylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	105-67-9	
Dimethylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	131-11-3	
Di-n-butylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	1830	1	04/19/18 17:13	04/20/18 17:30	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	606-20-2	
Di-n-octylphthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	117-81-7	
Fluoranthene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	206-44-0	
Fluorene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	87-68-3	
Hexachlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	118-74-1	
Hexachloroethane	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	193-39-5	
Isophorone	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	78-59-1	
1-Methylnaphthalene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	90-12-0	
2-Methylnaphthalene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-07 (15.18.5)** Lab ID: **10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	710	1	04/19/18 17:13	04/20/18 17:30		
Naphthalene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	91-20-3	
2-Nitroaniline	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	88-74-4	
3-Nitroaniline	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	99-09-2	
4-Nitroaniline	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	100-01-6	
Nitrobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	98-95-3	
2-Nitrophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	88-75-5	
4-Nitrophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	86-30-6	
Pentachlorophenol	ND	ug/kg	721	1	04/19/18 17:13	04/20/18 17:30	87-86-5	
Phenanthrene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	85-01-8	
Phenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	108-95-2	
Pyrene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	355	1	04/19/18 17:13	04/20/18 17:30	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	58	%.	43-125	1	04/19/18 17:13	04/20/18 17:30	4165-60-0	
2-Fluorobiphenyl (S)	67	%.	30-132	1	04/19/18 17:13	04/20/18 17:30	321-60-8	
p-Terphenyl-d14 (S)	70	%.	62-125	1	04/19/18 17:13	04/20/18 17:30	1718-51-0	
Phenol-d6 (S)	62	%.	48-125	1	04/19/18 17:13	04/20/18 17:30	13127-88-3	
2-Fluorophenol (S)	62	%.	40-125	1	04/19/18 17:13	04/20/18 17:30	367-12-4	
2,4,6-Tribromophenol (S)	55	%.	60-125	1	04/19/18 17:13	04/20/18 17:30	118-79-6	S5
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	83-32-9	
Acenaphthylene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	208-96-8	
Anthracene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	120-12-7	
Benzo(a)anthracene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	56-55-3	
Benzo(a)pyrene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	207-08-9	
Chrysene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	53-70-3	
Fluoranthene	15.6	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	206-44-0	
Fluorene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	193-39-5	
Naphthalene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	91-20-3	
Phenanthrene	ND	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	85-01-8	
Pyrene	13.2	ug/kg	10.8	1	04/17/18 12:13	04/18/18 17:39	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	72	%.	42-125	1	04/17/18 12:13	04/18/18 17:39	321-60-8	
p-Terphenyl-d14 (S)	92	%.	57-125	1	04/17/18 12:13	04/18/18 17:39	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-07 (15.18.5) **Lab ID: 10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1040	1	04/24/18 16:08	04/25/18 04:39	67-64-1	
Allyl chloride	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	107-05-1	
Benzene	ND	ug/kg	20.8	1	04/24/18 16:08	04/25/18 04:39	71-43-2	
Bromobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	108-86-1	
Bromochloromethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	74-97-5	
Bromodichloromethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	75-27-4	
Bromoform	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	75-25-2	
Bromomethane	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	74-83-9	
2-Butanone (MEK)	ND	ug/kg	261	1	04/24/18 16:08	04/25/18 04:39	78-93-3	
n-Butylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	104-51-8	
sec-Butylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	135-98-8	
tert-Butylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	98-06-6	
Carbon tetrachloride	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	56-23-5	
Chlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	108-90-7	
Chloroethane	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	75-00-3	
Chloroform	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	67-66-3	
Chloromethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	74-87-3	
2-Chlorotoluene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	95-49-8	
4-Chlorotoluene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	96-12-8	
Dibromochloromethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	106-93-4	
Dibromomethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	75-71-8	
1,1-Dichloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	75-34-3	
1,2-Dichloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	107-06-2	
1,1-Dichloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	156-60-5	
Dichlorofluoromethane	ND	ug/kg	521	1	04/24/18 16:08	04/25/18 04:39	75-43-4	
1,2-Dichloropropane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	78-87-5	
1,3-Dichloropropane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	142-28-9	
2,2-Dichloropropane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	594-20-7	
1,1-Dichloropropene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	60-29-7	
Ethylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	261	1	04/24/18 16:08	04/25/18 04:39	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	98-82-8	
p-Isopropyltoluene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	99-87-6	
Methylene Chloride	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	261	1	04/24/18 16:08	04/25/18 04:39	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-07 (15.18.5) **Lab ID: 10427354004** Collected: 04/13/18 12:20 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	1634-04-4	
Naphthalene	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	91-20-3	
n-Propylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	103-65-1	
Styrene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	79-34-5	
Tetrachloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	127-18-4	
Tetrahydrofuran	ND	ug/kg	2080	1	04/24/18 16:08	04/25/18 04:39	109-99-9	
Toluene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	79-00-5	
Trichloroethene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	79-01-6	
Trichlorofluoromethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	208	1	04/24/18 16:08	04/25/18 04:39	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	52.1	1	04/24/18 16:08	04/25/18 04:39	108-67-8	
Vinyl chloride	ND	ug/kg	20.8	1	04/24/18 16:08	04/25/18 04:39	75-01-4	
Xylene (Total)	ND	ug/kg	156	1	04/24/18 16:08	04/25/18 04:39	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	04/24/18 16:08	04/25/18 04:39	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/24/18 16:08	04/25/18 04:39	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/24/18 16:08	04/25/18 04:39	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	2.1	1	04/23/18 11:09	04/24/18 13:52	18540-29-9	
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	8.3	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.32	1	04/20/18 10:25	04/20/18 13:53	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	0.99	mg/kg	0.99	1	04/18/18 14:45	04/19/18 17:32	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) **Lab ID: 10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	15.2	1	04/25/18 10:56	04/30/18 14:06	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	309-00-2	
alpha-BHC	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	319-84-6	
beta-BHC	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	319-85-7	
delta-BHC	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	58-89-9	
Chlordane (Technical)	ND	ug/kg	2750	100	04/16/18 14:37	04/20/18 10:29	57-74-9	
alpha-Chlordane	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	5103-71-9	
gamma-Chlordane	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	5103-74-2	
4,4'-DDD	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	72-54-8	
4,4'-DDE	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	72-55-9	
4,4'-DDT	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	50-29-3	
Dieldrin	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	60-57-1	
Endosulfan I	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	959-98-8	
Endosulfan II	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	33213-65-9	
Endosulfan sulfate	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	1031-07-8	
Endrin	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	72-20-8	
Endrin aldehyde	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	7421-93-4	
Endrin ketone	ND	ug/kg	548	100	04/16/18 14:37	04/20/18 10:29	53494-70-5	
Heptachlor	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	76-44-8	
Heptachlor epoxide	ND	ug/kg	275	100	04/16/18 14:37	04/20/18 10:29	1024-57-3	
Methoxychlor	ND	ug/kg	2750	100	04/16/18 14:37	04/20/18 10:29	72-43-5	
Toxaphene	ND	ug/kg	8220	100	04/16/18 14:37	04/20/18 10:29	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	100	04/16/18 14:37	04/20/18 10:29	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	100	04/16/18 14:37	04/20/18 10:29	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	11100-14-4	
PCB, Total	ND	ug/kg	54.4	1	04/16/18 15:03	04/18/18 03:37	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	53	%	48-125	1	04/16/18 15:03	04/18/18 03:37	877-09-8	
Decachlorobiphenyl (S)	50	%	30-134	1	04/16/18 15:03	04/18/18 03:37	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) Lab ID: 10427354005 Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	2810	mg/kg	831	10	04/16/18 14:24	04/19/18 18:19		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/16/18 14:24	04/19/18 18:19	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	47.7	mg/kg	22.6	1	04/25/18 10:39	04/25/18 17:44		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/25/18 10:39	04/25/18 17:44	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	1030	mg/kg	16.0	1	04/17/18 04:48	04/17/18 19:41	7429-90-5	
Barium	83.2	mg/kg	0.80	1	04/17/18 04:48	04/17/18 19:41	7440-39-3	
Boron	22.3	mg/kg	12.0	1	04/17/18 04:48	04/17/18 19:41	7440-42-8	
Copper	6.0	mg/kg	0.80	1	04/17/18 04:48	04/17/18 19:41	7440-50-8	
Iron	5320	mg/kg	4.0	1	04/17/18 04:48	04/17/18 19:41	7439-89-6	
Manganese	75.7	mg/kg	0.40	1	04/17/18 04:48	04/17/18 19:41	7439-96-5	
Nickel	2.3	mg/kg	1.6	1	04/17/18 04:48	04/17/18 19:41	7440-02-0	
Silver	ND	mg/kg	0.80	1	04/17/18 04:48	04/17/18 19:41	7440-22-4	
Tin	ND	mg/kg	6.0	1	04/17/18 04:48	04/17/18 19:41	7440-31-5	
Titanium	131	mg/kg	2.0	1	04/17/18 04:48	04/17/18 19:41	7440-32-6	
Zinc	137	mg/kg	1.6	1	04/17/18 04:48	04/17/18 19:41	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	110	mg/kg	1.5	5	04/20/18 09:20	04/21/18 03:01	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7440-36-0	
Arsenic	ND	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7440-38-2	
Beryllium	ND	mg/kg	0.31	20	04/17/18 05:10	04/17/18 12:35	7440-41-7	
Cadmium	0.13	mg/kg	0.12	20	04/17/18 05:10	04/17/18 12:35	7440-43-9	
Cobalt	0.79	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7440-48-4	
Lead	56.1	mg/kg	0.16	20	04/17/18 05:10	04/17/18 12:35	7439-92-1	
Lithium	0.84	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7439-93-2	
Selenium	ND	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7782-49-2	
Strontium	64.2	mg/kg	0.78	20	04/17/18 05:10	04/17/18 12:35	7440-24-6	
Vanadium	2.5	mg/kg	1.6	20	04/17/18 05:10	04/17/18 12:35	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.15	mg/kg	0.032	1	04/23/18 05:40	04/23/18 15:31	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	39.4	%	0.10	1		04/19/18 11:06		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: **TS-SB-08 (10-20WM)** Lab ID: **10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	208-96-8	
Anthracene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	120-12-7	
Benzo(a)anthracene	3330	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	56-55-3	
Benzo(a)pyrene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	50-32-8	
Benzo(b)fluoranthene	3570	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	85-68-7	
Carbazole	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	59-50-7	
4-Chloroaniline	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	91-58-7	
2-Chlorophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	7005-72-3	
Chrysene	3700	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	53-70-3	
Dibenzofuran	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	120-83-2	
Diethylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	105-67-9	
Dimethylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	13900	5	04/19/18 17:13	04/24/18 17:51	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	122-66-7	
bis(2-Ethylhexyl)phthalate	100000	ug/kg	10800	20	04/19/18 17:13	04/24/18 19:47	117-81-7	
Fluoranthene	8330	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	206-44-0	
Fluorene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	87-68-3	
Hexachlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	118-74-1	
Hexachloroethane	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	193-39-5	
Isophorone	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) **Lab ID: 10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	5410	5	04/19/18 17:13	04/24/18 17:51		
Naphthalene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	91-20-3	
2-Nitroaniline	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	88-74-4	
3-Nitroaniline	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	99-09-2	
4-Nitroaniline	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	100-01-6	
Nitrobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	98-95-3	
2-Nitrophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	88-75-5	
4-Nitrophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	86-30-6	
Pentachlorophenol	ND	ug/kg	5500	5	04/19/18 17:13	04/24/18 17:51	87-86-5	
Phenanthrene	7550	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	85-01-8	
Phenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	108-95-2	
Pyrene	8120	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2710	5	04/19/18 17:13	04/24/18 17:51	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	60	%	43-125	5	04/19/18 17:13	04/24/18 17:51	4165-60-0	D4
2-Fluorobiphenyl (S)	73	%	30-132	5	04/19/18 17:13	04/24/18 17:51	321-60-8	
p-Terphenyl-d14 (S)	79	%	62-125	5	04/19/18 17:13	04/24/18 17:51	1718-51-0	
Phenol-d6 (S)	71	%	48-125	5	04/19/18 17:13	04/24/18 17:51	13127-88-3	
2-Fluorophenol (S)	72	%	40-125	5	04/19/18 17:13	04/24/18 17:51	367-12-4	
2,4,6-Tribromophenol (S)	66	%	60-125	5	04/19/18 17:13	04/24/18 17:51	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	674	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	83-32-9	
Acenaphthylene	ND	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	208-96-8	
Anthracene	1270	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	120-12-7	
Benzo(a)anthracene	1640	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	56-55-3	
Benzo(a)pyrene	1240	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	50-32-8	
Benzo(b)fluoranthene	1560	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	205-99-2	
Benzo(g,h,i)perylene	730	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	191-24-2	
Benzo(k)fluoranthene	760	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	207-08-9	
Chrysene	1940	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	218-01-9	
Dibenz(a,h)anthracene	220	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	53-70-3	
Fluoranthene	5080	ug/kg	411	25	04/17/18 12:13	04/19/18 21:50	206-44-0	
Fluorene	972	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	86-73-7	
Indeno(1,2,3-cd)pyrene	714	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	193-39-5	
Naphthalene	2240	ug/kg	82.2	5	04/17/18 12:13	04/18/18 21:23	91-20-3	
Phenanthrene	8530	ug/kg	411	25	04/17/18 12:13	04/19/18 21:50	85-01-8	
Pyrene	3920	ug/kg	411	25	04/17/18 12:13	04/19/18 21:50	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	67	%	42-125	5	04/17/18 12:13	04/18/18 21:23	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) Lab ID: 10427354005 Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	81	%	57-125	5	04/17/18 12:13	04/18/18 21:23	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2290	1	04/24/18 16:08	04/25/18 04:55	67-64-1	
Allyl chloride	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	107-05-1	
Benzene	ND	ug/kg	45.7	1	04/24/18 16:08	04/25/18 04:55	71-43-2	
Bromobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	108-86-1	
Bromochloromethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	74-97-5	
Bromodichloromethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	75-27-4	
Bromoform	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	75-25-2	
Bromomethane	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	74-83-9	
2-Butanone (MEK)	ND	ug/kg	572	1	04/24/18 16:08	04/25/18 04:55	78-93-3	
n-Butylbenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	104-51-8	
sec-Butylbenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	135-98-8	
tert-Butylbenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	98-06-6	
Carbon tetrachloride	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	56-23-5	
Chlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	108-90-7	
Chloroethane	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	75-00-3	
Chloroform	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	67-66-3	
Chloromethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	74-87-3	
2-Chlorotoluene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	95-49-8	
4-Chlorotoluene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	96-12-8	
Dibromochloromethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	106-93-4	
Dibromomethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	541-73-1	
1,4-Dichlorobenzene	512	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	75-71-8	
1,1-Dichloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	75-34-3	
1,2-Dichloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	107-06-2	
1,1-Dichloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1140	1	04/24/18 16:08	04/25/18 04:55	75-43-4	
1,2-Dichloropropane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	78-87-5	
1,3-Dichloropropane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	142-28-9	
2,2-Dichloropropane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	594-20-7	
1,1-Dichloropropene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	60-29-7	
Ethylbenzene	649	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	572	1	04/24/18 16:08	04/25/18 04:55	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Sample: TS-SB-08 (10-20WM) **Lab ID: 10427354005** Collected: 04/13/18 14:10 Received: 04/13/18 16:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	292	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	98-82-8	
p-Isopropyltoluene	635	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	99-87-6	
Methylene Chloride	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	572	1	04/24/18 16:08	04/25/18 04:55	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	1634-04-4	
Naphthalene	4880	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	91-20-3	
n-Propylbenzene	329	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	103-65-1	
Styrene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	79-34-5	
Tetrachloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	127-18-4	
Tetrahydrofuran	ND	ug/kg	4570	1	04/24/18 16:08	04/25/18 04:55	109-99-9	
Toluene	135	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	79-00-5	
Trichloroethene	ND	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	79-01-6	
Trichlorofluoromethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	457	1	04/24/18 16:08	04/25/18 04:55	76-13-1	
1,2,4-Trimethylbenzene	1130	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	95-63-6	
1,3,5-Trimethylbenzene	366	ug/kg	114	1	04/24/18 16:08	04/25/18 04:55	108-67-8	
Vinyl chloride	ND	ug/kg	45.7	1	04/24/18 16:08	04/25/18 04:55	75-01-4	
Xylene (Total)	1320	ug/kg	343	1	04/24/18 16:08	04/25/18 04:55	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/24/18 16:08	04/25/18 04:55	17060-07-0	
Toluene-d8 (S)	97	%	75-125	1	04/24/18 16:08	04/25/18 04:55	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125	1	04/24/18 16:08	04/25/18 04:55	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	65.2	20	04/23/18 11:09	04/24/18 13:53	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	110	mg/kg	1.0	1		04/26/18 11:45	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	1.1	mg/kg	0.65	1	04/20/18 10:25	04/20/18 13:54	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/18/18 14:45	04/19/18 17:52	16984-48-8	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 141622 Analysis Method: EPA 1630 (1998)
 QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
 Associated Lab Samples: 10427354002, 10427354003, 10427354004

METHOD BLANK: 559956 Matrix: Solid
 Associated Lab Samples: 10427354002, 10427354003, 10427354004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.16	04/27/18 14:14	N3

METHOD BLANK: 559957 Matrix: Solid
 Associated Lab Samples: 10427354002, 10427354003, 10427354004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/27/18 14:20	N3

METHOD BLANK: 559958 Matrix: Solid
 Associated Lab Samples: 10427354002, 10427354003, 10427354004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.14	04/27/18 14:27	N3

LABORATORY CONTROL SAMPLE: 559959

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	99.7	116	117	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559960 559961

Parameter	Units	10427018004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	374	387	412	449	110	116	65-135	9	35	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559962 559963

Parameter	Units	10427291002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	344	356	391	403	114	113	65-135	3	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10427354

QC Batch: 141683 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10427354001, 10427354005

METHOD BLANK: 560161 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/30/18 13:39	N3

METHOD BLANK: 560162 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	2.98	04/30/18 13:46	N3

METHOD BLANK: 560163 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.04	04/30/18 13:53	N3

LABORATORY CONTROL SAMPLE: 560164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	119	115	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 560165 560166

Parameter	Units	10427354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	357	357	354	388	99	108	65-135	9	35	N3

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10427354

QC Batch: 534067 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2901345 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/25/18 14:28	
a,a,a-Trifluorotoluene (S)	%.	99	80-150	04/25/18 14:28	

LABORATORY CONTROL SAMPLE & LCSD: 2901346

Parameter	Units	2901346		2901347		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
Gasoline Range Organics	mg/kg	50	43.7	44.3	87	89	80-120	2	20
a,a,a-Trifluorotoluene (S)	%.				98	98	80-150		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2902666 2902667

Parameter	Units	10428015007		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Gasoline Range Organics	mg/kg	ND	57.6	56.7	61.1	58.2	99	96	80-120	5	20
a,a,a-Trifluorotoluene (S)	%.						98	99	80-150		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 533671 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2898910 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	04/23/18 15:14	

LABORATORY CONTROL SAMPLE: 2898911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.42	0.46	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898912 2898913

Parameter	Units	10427354002		2898912		2898913		% Rec Limits	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Mercury	mg/kg	0.14	.62	.7	0.81	0.96	109	115	80-120	17	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532662 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2892962 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.9	04/17/18 18:34	
Barium	mg/kg	ND	0.50	04/17/18 18:34	
Boron	mg/kg	ND	7.4	04/17/18 18:34	
Copper	mg/kg	ND	0.50	04/17/18 18:34	
Iron	mg/kg	ND	2.5	04/17/18 18:34	
Manganese	mg/kg	ND	0.25	04/17/18 18:34	
Nickel	mg/kg	ND	0.99	04/17/18 18:34	
Silver	mg/kg	ND	0.50	04/17/18 18:34	
Tin	mg/kg	ND	3.7	04/17/18 18:34	
Titanium	mg/kg	ND	1.2	04/17/18 18:34	
Zinc	mg/kg	ND	0.99	04/17/18 18:34	

LABORATORY CONTROL SAMPLE: 2892963

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	990	992	100	80-120	
Barium	mg/kg	49.5	49.7	100	80-120	
Boron	mg/kg	49.5	46.6	94	80-120	
Copper	mg/kg	49.5	47.9	97	80-120	
Iron	mg/kg	990	986	100	80-120	
Manganese	mg/kg	49.5	50.0	101	80-120	
Nickel	mg/kg	49.5	49.4	100	80-120	
Silver	mg/kg	24.8	23.2	94	80-120	
Tin	mg/kg	49.5	50.1	101	80-120	
Titanium	mg/kg	49.5	49.4	100	80-120	
Zinc	mg/kg	49.5	50.2	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2892964 2892965

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427351005 Result	Spike Conc.	Spike Conc.	Result						
Aluminum	mg/kg	1400	1120	1110	3090	3090	152	153	75-125	0	20 P6
Barium	mg/kg	35.2	55.9	55.3	99.0	101	114	118	75-125	2	20
Boron	mg/kg	ND	55.9	55.3	54.9	55.1	90	91	75-125	0	20
Copper	mg/kg	41.0	55.9	55.3	132	119	162	141	75-125	10	20 M1
Iron	mg/kg	27900	1120	1110	65600	58600	3380	2780	75-125	11	20 P6
Manganese	mg/kg	155	55.9	55.3	380	325	403	307	75-125	16	20 M1
Nickel	mg/kg	21.6	55.9	55.3	92.0	83.3	126	111	75-125	10	20 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Parameter	Units	2892964		2892965		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427351005 Result	MS Spike Conc.	MSD Spike Conc.									
Silver	mg/kg	ND	28	27.7	25.3	25.3	90	91	75-125	0	20		
Tin	mg/kg	ND	55.9	55.3	54.1	53.3	91	91	75-125	1	20		
Titanium	mg/kg	176	55.9	55.3	269	258	165	149	75-125	4	20	M1	
Zinc	mg/kg	88.0	55.9	55.3	170	172	146	152	75-125	1	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 437531

Analysis Method: EPA 6020

QC Batch Method: EPA 3050B

Analysis Description: 6020 MET

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2021107

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.18	04/21/18 01:07	N2

LABORATORY CONTROL SAMPLE: 2021108

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.8	3.7	99	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021109 2021110

Parameter	Units	2021109		2021110		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427291001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	53.4	5.64	5.49	61.8	58.5	152	94	75-125	6	20 N2,P6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532660 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2892954 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	04/17/18 11:38	
Arsenic	mg/kg	ND	0.50	04/17/18 11:38	
Beryllium	mg/kg	ND	0.20	04/17/18 11:38	
Cadmium	mg/kg	ND	0.079	04/17/18 11:38	
Cobalt	mg/kg	ND	0.50	04/17/18 11:38	
Lead	mg/kg	ND	0.099	04/17/18 11:38	
Lithium	mg/kg	ND	0.50	04/17/18 11:38	
Selenium	mg/kg	ND	0.50	04/17/18 11:38	
Strontium	mg/kg	ND	0.50	04/17/18 11:38	
Vanadium	mg/kg	ND	0.99	04/17/18 11:38	

LABORATORY CONTROL SAMPLE: 2892955

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	48.1	50.1	104	80-120	
Arsenic	mg/kg	48.1	48.5	101	80-120	
Beryllium	mg/kg	48.1	49.9	104	80-120	
Cadmium	mg/kg	48.1	48.4	101	80-120	
Cobalt	mg/kg	48.1	49.9	104	80-120	
Lead	mg/kg	48.1	48.9	102	80-120	
Lithium	mg/kg	48.1	50.1	104	80-120	
Selenium	mg/kg	48.1	49.3	102	80-120	
Strontium	mg/kg	48.1	48.7	101	80-120	
Vanadium	mg/kg	48.1	49.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2892956 2892957

Parameter	Units	10427419021		MS		MSD		% Rec	% Rec	% Rec	Max	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	MS					
Antimony	mg/kg	0.80	49	49	24.9	26.3	49	52	75-125	5	20	M6
Arsenic	mg/kg	20.9	49	49	79.6	73.5	120	107	75-125	8	20	
Beryllium	mg/kg	0.84	49	49	49.6	51.1	100	102	75-125	3	20	
Cadmium	mg/kg	0.54	49	49	52.7	52.5	106	106	75-125	0	20	
Cobalt	mg/kg	9.3	49	49	65.5	63.7	114	111	75-125	3	20	
Lead	mg/kg	59.4	49	49	108	103	99	89	75-125	5	20	
Lithium	mg/kg	14.4	49	49	60.9	61.8	95	97	75-125	1	20	
Selenium	mg/kg	0.30J	49	49	48.4	49.8	98	101	75-125	3	20	
Strontium	mg/kg	34.6	49	49	94.7	91.9	122	117	75-125	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2892956		2892957									
Parameter	Units	10427419021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Vanadium	mg/kg	32.6	49	49	89.6	87.1	116	111	75-125	3	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 533197

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

SAMPLE DUPLICATE: 2896518

Parameter	Units	10427638001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	24.6	24.9	1	30	

SAMPLE DUPLICATE: 2896519

Parameter	Units	10427249001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	83.7	83.8	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 534064 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2901329 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/25/18 01:17	
1,1-Dichloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,1-Dichloroethene	ug/kg	ND	50.0	04/25/18 01:17	
1,1-Dichloropropene	ug/kg	ND	50.0	04/25/18 01:17	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,2,3-Trichloropropane	ug/kg	ND	200	04/25/18 01:17	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/25/18 01:17	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/25/18 01:17	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,2-Dichloroethane	ug/kg	ND	50.0	04/25/18 01:17	
1,2-Dichloropropane	ug/kg	ND	50.0	04/25/18 01:17	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
1,3-Dichloropropane	ug/kg	ND	50.0	04/25/18 01:17	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
2,2-Dichloropropane	ug/kg	ND	200	04/25/18 01:17	
2-Butanone (MEK)	ug/kg	ND	250	04/25/18 01:17	
2-Chlorotoluene	ug/kg	ND	50.0	04/25/18 01:17	
4-Chlorotoluene	ug/kg	ND	50.0	04/25/18 01:17	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/25/18 01:17	
Acetone	ug/kg	ND	1000	04/25/18 01:17	
Allyl chloride	ug/kg	ND	200	04/25/18 01:17	
Benzene	ug/kg	ND	20.0	04/25/18 01:17	
Bromobenzene	ug/kg	ND	50.0	04/25/18 01:17	
Bromochloromethane	ug/kg	ND	50.0	04/25/18 01:17	
Bromodichloromethane	ug/kg	ND	50.0	04/25/18 01:17	
Bromoform	ug/kg	ND	500	04/25/18 01:17	MN
Bromomethane	ug/kg	ND	500	04/25/18 01:17	
Carbon tetrachloride	ug/kg	ND	50.0	04/25/18 01:17	
Chlorobenzene	ug/kg	ND	50.0	04/25/18 01:17	
Chloroethane	ug/kg	ND	500	04/25/18 01:17	
Chloroform	ug/kg	ND	50.0	04/25/18 01:17	
Chloromethane	ug/kg	ND	200	04/25/18 01:17	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/25/18 01:17	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/25/18 01:17	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

METHOD BLANK: 2901329

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/25/18 01:17	
Dibromomethane	ug/kg	ND	50.0	04/25/18 01:17	
Dichlorodifluoromethane	ug/kg	ND	200	04/25/18 01:17	
Dichlorofluoromethane	ug/kg	ND	500	04/25/18 01:17	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/25/18 01:17	
Ethylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/25/18 01:17	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/25/18 01:17	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/25/18 01:17	
Methylene Chloride	ug/kg	ND	200	04/25/18 01:17	
n-Butylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
n-Propylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
Naphthalene	ug/kg	ND	200	04/25/18 01:17	
p-Isopropyltoluene	ug/kg	ND	50.0	04/25/18 01:17	
sec-Butylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
Styrene	ug/kg	ND	50.0	04/25/18 01:17	
tert-Butylbenzene	ug/kg	ND	50.0	04/25/18 01:17	
Tetrachloroethene	ug/kg	ND	50.0	04/25/18 01:17	
Tetrahydrofuran	ug/kg	ND	2000	04/25/18 01:17	
Toluene	ug/kg	ND	50.0	04/25/18 01:17	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/25/18 01:17	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/25/18 01:17	
Trichloroethene	ug/kg	ND	50.0	04/25/18 01:17	
Trichlorofluoromethane	ug/kg	ND	200	04/25/18 01:17	
Vinyl chloride	ug/kg	ND	20.0	04/25/18 01:17	
Xylene (Total)	ug/kg	ND	150	04/25/18 01:17	
1,2-Dichloroethane-d4 (S)	%	94	75-125	04/25/18 01:17	
4-Bromofluorobenzene (S)	%	99	75-125	04/25/18 01:17	
Toluene-d8 (S)	%	97	75-125	04/25/18 01:17	

LABORATORY CONTROL SAMPLE & LCSD: 2901330

2901331

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	1050	999	105	100	59-125	5	20	
1,1,1-Trichloroethane	ug/kg	1000	1030	1010	103	101	59-125	2	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	985	943	99	94	58-125	4	20	
1,1,2-Trichloroethane	ug/kg	1000	1010	960	101	96	64-125	5	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	946	881	95	88	65-125	7	20	
1,1-Dichloroethane	ug/kg	1000	1010	971	101	97	63-125	4	20	
1,1-Dichloroethene	ug/kg	1000	1000	975	100	97	59-125	3	20	
1,1-Dichloropropene	ug/kg	1000	1050	1050	105	105	64-125	1	20	
1,2,3-Trichlorobenzene	ug/kg	1000	949	964	95	96	55-126	2	20	
1,2,3-Trichloropropane	ug/kg	1000	933	899	93	90	62-125	4	20	
1,2,4-Trichlorobenzene	ug/kg	1000	982	996	98	100	62-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE & LCSD: 2901330		2901331								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	961	936	96	94	59-125	3	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2300	2320	92	93	54-125	1	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	1080	1010	108	101	64-125	7	20	
1,2-Dichlorobenzene	ug/kg	1000	980	963	98	96	63-125	2	20	
1,2-Dichloroethane	ug/kg	1000	937	893	94	89	57-125	5	20	
1,2-Dichloropropane	ug/kg	1000	947	917	95	92	67-125	3	20	
1,3,5-Trimethylbenzene	ug/kg	1000	988	965	99	97	59-125	2	20	
1,3-Dichlorobenzene	ug/kg	1000	975	967	98	97	64-125	1	20	
1,3-Dichloropropane	ug/kg	1000	986	964	99	96	64-125	2	20	
1,4-Dichlorobenzene	ug/kg	1000	937	921	94	92	63-125	2	20	
2,2-Dichloropropane	ug/kg	1000	1020	977	102	98	37-126	4	20	
2-Butanone (MEK)	ug/kg	5000	4810	4800	96	96	48-125	0	20	
2-Chlorotoluene	ug/kg	1000	981	942	98	94	62-125	4	20	
4-Chlorotoluene	ug/kg	1000	968	951	97	95	63-125	2	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4860	4550	97	91	52-135	6	20	
Acetone	ug/kg	5000	5580	5890	112	118	65-125	5	20	
Allyl chloride	ug/kg	1000	961	953	96	95	52-125	1	20	
Benzene	ug/kg	1000	1030	980	103	98	61-125	4	20	
Bromobenzene	ug/kg	1000	1010	1010	101	101	64-125	0	20	
Bromochloromethane	ug/kg	1000	960	960	96	96	65-125	0	20	
Bromodichloromethane	ug/kg	1000	1010	981	101	98	57-125	3	20	
Bromoform	ug/kg	1000	962	942	96	94	57-125	2	20	
Bromomethane	ug/kg	1000	758	832	76	83	60-125	9	20	
Carbon tetrachloride	ug/kg	1000	1040	983	104	98	58-125	6	20	
Chlorobenzene	ug/kg	1000	993	920	99	92	66-125	8	20	
Chloroethane	ug/kg	1000	895	850	89	85	62-125	5	20	
Chloroform	ug/kg	1000	942	908	94	91	59-125	4	20	
Chloromethane	ug/kg	1000	801	784	80	78	50-125	2	20	
cis-1,2-Dichloroethene	ug/kg	1000	982	964	98	96	61-125	2	20	
cis-1,3-Dichloropropene	ug/kg	1000	1040	1020	104	102	61-125	2	20	
Dibromochloromethane	ug/kg	1000	957	902	96	90	60-125	6	20	
Dibromomethane	ug/kg	1000	1030	994	103	99	69-125	4	20	
Dichlorodifluoromethane	ug/kg	1000	727	668	73	67	38-125	8	20	
Dichlorofluoromethane	ug/kg	1000	990	922	99	92	67-125	7	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1910	1590	191	159	60-125	19	20	CH,L3,SS
Ethylbenzene	ug/kg	1000	1040	971	104	97	62-125	7	20	
Hexachloro-1,3-butadiene	ug/kg	1000	987	981	99	98	56-125	1	20	
Isopropylbenzene (Cumene)	ug/kg	1000	1060	985	106	99	65-125	8	20	
Methyl-tert-butyl ether	ug/kg	1000	931	887	93	89	59-125	5	20	
Methylene Chloride	ug/kg	1000	906	917	91	92	64-125	1	20	
n-Butylbenzene	ug/kg	1000	1020	983	102	98	59-125	3	20	
n-Propylbenzene	ug/kg	1000	1010	965	101	97	61-125	4	20	
Naphthalene	ug/kg	1000	961	966	96	97	53-125	0	20	
p-Isopropyltoluene	ug/kg	1000	1040	1000	104	100	63-125	4	20	
sec-Butylbenzene	ug/kg	1000	989	950	99	95	62-125	4	20	
Styrene	ug/kg	1000	1030	990	103	99	66-125	4	20	
tert-Butylbenzene	ug/kg	1000	980	942	98	94	64-125	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE & LCSD: 2901330

Parameter	Units	2901331							Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD		
Tetrachloroethene	ug/kg	1000	1080	1020	108	102	67-125	6	20	
Tetrahydrofuran	ug/kg	10000	9720	9470	97	95	62-125	3	20	
Toluene	ug/kg	1000	967	915	97	91	61-125	6	20	
trans-1,2-Dichloroethene	ug/kg	1000	1050	1030	105	103	64-125	1	20	
trans-1,3-Dichloropropene	ug/kg	1000	1070	1030	107	103	56-125	4	20	
Trichloroethene	ug/kg	1000	1020	951	102	95	67-125	7	20	
Trichlorofluoromethane	ug/kg	1000	1010	956	101	96	65-125	6	20	
Vinyl chloride	ug/kg	1000	902	890	90	89	57-125	1	20	
Xylene (Total)	ug/kg	3000	3040	2830	101	94	62-125	7	20	
1,2-Dichloroethane-d4 (S)	%				97	96	75-125			
4-Bromofluorobenzene (S)	%				101	101	75-125			
Toluene-d8 (S)	%				103	101	75-125			

MATRIX SPIKE SAMPLE: 2901503

Parameter	Units	10428008008		MS		% Rec Limits	Qualifiers
		Result	Spike Conc.	Result	% Rec		
1,1,1,2-Tetrachloroethane	ug/kg	ND	1160	1340	115	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1160	1490	128	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1160	1310	112	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1160	1280	110	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1160	1280	110	60-142	
1,1-Dichloroethane	ug/kg	ND	1160	1350	116	57-140	
1,1-Dichloroethene	ug/kg	ND	1160	1330	115	59-139	
1,1-Dichloropropene	ug/kg	ND	1160	1480	127	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1160	1280	110	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1160	1350	116	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1160	1300	112	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1160	1280	110	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2900	3230	111	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1160	1370	118	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1160	1290	111	70-142	
1,2-Dichloroethane	ug/kg	ND	1160	1250	107	58-132	
1,2-Dichloropropane	ug/kg	ND	1160	1330	114	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1160	1290	111	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1160	1290	111	71-142	
1,3-Dichloropropane	ug/kg	ND	1160	1270	110	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1160	1210	104	68-142	
2,2-Dichloropropane	ug/kg	ND	1160	1280	111	34-150	
2-Butanone (MEK)	ug/kg	ND	5810	7590	131	51-150	
2-Chlorotoluene	ug/kg	ND	1160	1290	111	66-144	
4-Chlorotoluene	ug/kg	ND	1160	1260	108	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5810	6380	110	63-150	
Acetone	ug/kg	ND	5810	8260	142	54-150	
Allyl chloride	ug/kg	ND	1160	1350	116	53-135	
Benzene	ug/kg	ND	1160	1320	114	65-135	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

MATRIX SPIKE SAMPLE: 2901503		10428008008	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1160	1370	118	71-141	
Bromochloromethane	ug/kg	ND	1160	1390	120	62-145	
Bromodichloromethane	ug/kg	ND	1160	1370	118	59-148	
Bromoform	ug/kg	ND	1160	1210	104	57-145	
Bromomethane	ug/kg	ND	1160	1230	106	51-129	
Carbon tetrachloride	ug/kg	ND	1160	1470	127	55-144	
Chlorobenzene	ug/kg	ND	1160	1250	107	70-142	
Chloroethane	ug/kg	ND	1160	1250	107	61-135	
Chloroform	ug/kg	ND	1160	1340	115	58-135	
Chloromethane	ug/kg	ND	1160	1080	93	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1160	1360	117	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1160	1380	118	62-142	
Dibromochloromethane	ug/kg	ND	1160	1240	107	65-141	
Dibromomethane	ug/kg	ND	1160	1360	117	72-150	
Dichlorodifluoromethane	ug/kg	ND	1160	897	77	30-125	
Dichlorofluoromethane	ug/kg	ND	1160	1300	112	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1160	2940	253	62-135	CH,M0,SS
Ethylbenzene	ug/kg	ND	1160	1280	110	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1160	1300	112	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1160	1320	114	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1160	1280	110	63-139	
Methylene Chloride	ug/kg	ND	1160	1250	107	58-135	
n-Butylbenzene	ug/kg	ND	1160	1290	111	63-150	
n-Propylbenzene	ug/kg	ND	1160	1310	113	70-146	
Naphthalene	ug/kg	ND	1160	1300	111	63-150	
p-Isopropyltoluene	ug/kg	ND	1160	1340	116	72-150	
sec-Butylbenzene	ug/kg	ND	1160	1290	111	66-150	
Styrene	ug/kg	ND	1160	1310	113	72-146	
tert-Butylbenzene	ug/kg	ND	1160	1300	112	71-148	
Tetrachloroethene	ug/kg	ND	1160	1360	117	70-150	
Tetrahydrofuran	ug/kg	ND	11600	13900	120	62-150	
Toluene	ug/kg	ND	1160	1220	105	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1160	1390	120	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1160	1340	115	57-147	
Trichloroethene	ug/kg	ND	1160	1330	115	62-150	
Trichlorofluoromethane	ug/kg	ND	1160	1310	113	51-150	
Vinyl chloride	ug/kg	ND	1160	1210	104	45-132	
Xylene (Total)	ug/kg	ND	3480	3760	108	75-140	
1,2-Dichloroethane-d4 (S)	%					96	75-125
4-Bromofluorobenzene (S)	%					101	75-125
Toluene-d8 (S)	%					99	75-125

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

SAMPLE DUPLICATE: 2901333

Parameter	Units	10428008009 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

SAMPLE DUPLICATE: 2901333

Parameter	Units	10428008009 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	95	94	3		
4-Bromofluorobenzene (S)	%.	97	99	1		
Toluene-d8 (S)	%.	98	100	1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532491 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2891843 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/16/18 21:16	
4,4'-DDE	ug/kg	ND	3.3	04/16/18 21:16	
4,4'-DDT	ug/kg	ND	3.3	04/16/18 21:16	
Aldrin	ug/kg	ND	1.7	04/16/18 21:16	
alpha-BHC	ug/kg	ND	1.7	04/16/18 21:16	
alpha-Chlordane	ug/kg	ND	1.7	04/16/18 21:16	
beta-BHC	ug/kg	ND	1.7	04/16/18 21:16	
Chlordane (Technical)	ug/kg	ND	16.7	04/16/18 21:16	
delta-BHC	ug/kg	ND	1.7	04/16/18 21:16	
Dieldrin	ug/kg	ND	3.3	04/16/18 21:16	
Endosulfan I	ug/kg	ND	1.7	04/16/18 21:16	
Endosulfan II	ug/kg	ND	3.3	04/16/18 21:16	
Endosulfan sulfate	ug/kg	ND	3.3	04/16/18 21:16	
Endrin	ug/kg	ND	3.3	04/16/18 21:16	
Endrin aldehyde	ug/kg	ND	3.3	04/16/18 21:16	
Endrin ketone	ug/kg	ND	3.3	04/16/18 21:16	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/16/18 21:16	
gamma-Chlordane	ug/kg	ND	1.7	04/16/18 21:16	
Heptachlor	ug/kg	ND	1.7	04/16/18 21:16	
Heptachlor epoxide	ug/kg	ND	1.7	04/16/18 21:16	
Methoxychlor	ug/kg	ND	16.7	04/16/18 21:16	
Toxaphene	ug/kg	ND	50.0	04/16/18 21:16	
Decachlorobiphenyl (S)	%	96	30-150	04/16/18 21:16	
Tetrachloro-m-xylene (S)	%	98	30-150	04/16/18 21:16	

LABORATORY CONTROL SAMPLE: 2891844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	33.5	100	62-127	
4,4'-DDE	ug/kg	33.3	33.3	100	66-125	
4,4'-DDT	ug/kg	33.3	33.6	101	67-128	
Aldrin	ug/kg	16.7	15.1	91	66-125	
alpha-BHC	ug/kg	16.7	16.1	96	64-125	
alpha-Chlordane	ug/kg	16.7	15.5	93	68-125	
beta-BHC	ug/kg	16.7	15.4	93	69-125	
delta-BHC	ug/kg	16.7	13.0	78	42-133	
Dieldrin	ug/kg	33.3	34.2	103	69-126	
Endosulfan I	ug/kg	16.7	14.2	85	63-125	
Endosulfan II	ug/kg	33.3	33.0	99	69-125	
Endosulfan sulfate	ug/kg	33.3	28.8	87	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE: 2891844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.5	95	69-125	
Endrin aldehyde	ug/kg	33.3	31.4	94	65-125	
Endrin ketone	ug/kg	33.3	33.1	99	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	15.9	95	67-125	
gamma-Chlordane	ug/kg	16.7	14.0	84	63-125	
Heptachlor	ug/kg	16.7	16.2	97	69-125	
Heptachlor epoxide	ug/kg	16.7	15.5	93	68-125	
Methoxychlor	ug/kg	167	163	98	65-134	
Decachlorobiphenyl (S)	%			94	30-150	
Tetrachloro-m-xylene (S)	%			98	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891845 2891846

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427018001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	50.7	50.5	53.3	56.7	105	112	56-125	6	20
4,4'-DDE	ug/kg	ND	50.7	50.5	56.1	55.9	111	110	32-150	0	20
4,4'-DDT	ug/kg	ND	50.7	50.5	54.8	52.9	108	105	60-132	4	20
Aldrin	ug/kg	ND	25.4	25.3	20J	21.5J	79	85	56-125		20
alpha-BHC	ug/kg	ND	25.4	25.3	25.2J	24.3J	99	96	54-136		20
alpha-Chlordane	ug/kg	ND	25.4	25.3	25.7	28.8	101	114	54-133	12	20
beta-BHC	ug/kg	ND	25.4	25.3	26.7	26.6	105	105	30-150	0	20
delta-BHC	ug/kg	ND	25.4	25.3	17.1J	18.7J	68	74	45-145		20
Dieldrin	ug/kg	ND	50.7	50.5	63.9	54.7	126	108	47-150	15	20
Endosulfan I	ug/kg	ND	25.4	25.3	24.1J	24.4J	95	97	35-145		20
Endosulfan II	ug/kg	ND	50.7	50.5	46.4J	49.1J	92	97	50-147		20
Endosulfan sulfate	ug/kg	ND	50.7	50.5	39.2J	44J	77	87	54-132		20
Endrin	ug/kg	ND	50.7	50.5	41.8J	44.2J	82	87	62-125		20
Endrin aldehyde	ug/kg	ND	50.7	50.5	45.3J	48.8J	89	97	33-150		20
Endrin ketone	ug/kg	ND	50.7	50.5	45.9J	49.7J	91	98	56-144		20
gamma-BHC (Lindane)	ug/kg	ND	25.4	25.3	23.7J	25.1J	94	99	63-125		20
gamma-Chlordane	ug/kg	ND	25.4	25.3	21.9J	23.2J	86	92	45-132		20
Heptachlor	ug/kg	ND	25.4	25.3	21.1J	23.1J	83	91	51-142		20
Heptachlor epoxide	ug/kg	ND	25.4	25.3	14.1J	25.5	56	101	50-142		20
Methoxychlor	ug/kg	ND	254	253	278	283	109	112	58-139	2	20
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		4M, D3, S4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532605 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2892737 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/18/18 01:31	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/18/18 01:31	
Decachlorobiphenyl (S)	%	96	30-134	04/18/18 01:31	
Tetrachloro-m-xylene (S)	%	94	48-125	04/18/18 01:31	

LABORATORY CONTROL SAMPLE: 2892738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	576	86	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	587	88	62-125	
Decachlorobiphenyl (S)	%			95	30-134	
Tetrachloro-m-xylene (S)	%			92	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2892739 2892740

Parameter	Units	2892739		2892740		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
PCB-1016 (Aroclor 1016)	ug/kg	ND	751	751	652	620	87	83	30-150	5	30	
PCB-1260 (Aroclor 1260)	ug/kg	150	751	751	622	569	63	56	30-138	9	30	
Decachlorobiphenyl (S)	%						73	71	30-134			
Tetrachloro-m-xylene (S)	%						77	75	48-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 533361 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2897277 Matrix: Solid
Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/20/18 12:32	
1,2-Dichlorobenzene	ug/kg	ND	330	04/20/18 12:32	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/20/18 12:32	
1,3-Dichlorobenzene	ug/kg	ND	330	04/20/18 12:32	
1,4-Dichlorobenzene	ug/kg	ND	330	04/20/18 12:32	
1-Methylnaphthalene	ug/kg	ND	330	04/20/18 12:32	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/20/18 12:32	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/20/18 12:32	
2,4-Dichlorophenol	ug/kg	ND	330	04/20/18 12:32	
2,4-Dimethylphenol	ug/kg	ND	330	04/20/18 12:32	
2,4-Dinitrophenol	ug/kg	ND	330	04/20/18 12:32	
2,4-Dinitrotoluene	ug/kg	ND	330	04/20/18 12:32	
2,6-Dinitrotoluene	ug/kg	ND	330	04/20/18 12:32	
2-Chloronaphthalene	ug/kg	ND	330	04/20/18 12:32	
2-Chlorophenol	ug/kg	ND	330	04/20/18 12:32	
2-Methylnaphthalene	ug/kg	ND	330	04/20/18 12:32	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/20/18 12:32	
2-Nitroaniline	ug/kg	ND	330	04/20/18 12:32	
2-Nitrophenol	ug/kg	ND	330	04/20/18 12:32	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/20/18 12:32	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/20/18 12:32	
3-Nitroaniline	ug/kg	ND	330	04/20/18 12:32	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/20/18 12:32	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/20/18 12:32	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/20/18 12:32	
4-Chloroaniline	ug/kg	ND	330	04/20/18 12:32	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/20/18 12:32	
4-Nitroaniline	ug/kg	ND	330	04/20/18 12:32	
4-Nitrophenol	ug/kg	ND	330	04/20/18 12:32	
Acenaphthene	ug/kg	ND	330	04/20/18 12:32	
Acenaphthylene	ug/kg	ND	330	04/20/18 12:32	
Anthracene	ug/kg	ND	330	04/20/18 12:32	
Benzo(a)anthracene	ug/kg	ND	330	04/20/18 12:32	
Benzo(a)pyrene	ug/kg	ND	330	04/20/18 12:32	
Benzo(b)fluoranthene	ug/kg	ND	330	04/20/18 12:32	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/20/18 12:32	
Benzo(k)fluoranthene	ug/kg	ND	330	04/20/18 12:32	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/20/18 12:32	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/20/18 12:32	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/20/18 12:32	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/20/18 12:32	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

METHOD BLANK: 2897277

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/20/18 12:32	
Carbazole	ug/kg	ND	330	04/20/18 12:32	
Chrysene	ug/kg	ND	330	04/20/18 12:32	
Di-n-butylphthalate	ug/kg	ND	330	04/20/18 12:32	
Di-n-octylphthalate	ug/kg	ND	330	04/20/18 12:32	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/20/18 12:32	
Dibenzofuran	ug/kg	ND	330	04/20/18 12:32	
Diethylphthalate	ug/kg	ND	330	04/20/18 12:32	
Dimethylphthalate	ug/kg	ND	330	04/20/18 12:32	
Fluoranthene	ug/kg	ND	330	04/20/18 12:32	
Fluorene	ug/kg	ND	330	04/20/18 12:32	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/20/18 12:32	
Hexachlorobenzene	ug/kg	ND	330	04/20/18 12:32	
Hexachloroethane	ug/kg	ND	330	04/20/18 12:32	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/20/18 12:32	
Isophorone	ug/kg	ND	330	04/20/18 12:32	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/20/18 12:32	
N-Nitrosodimethylamine	ug/kg	ND	330	04/20/18 12:32	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/20/18 12:32	
Naphthalene	ug/kg	ND	330	04/20/18 12:32	
Nitrobenzene	ug/kg	ND	330	04/20/18 12:32	
Pentachlorophenol	ug/kg	ND	670	04/20/18 12:32	
Phenanthrene	ug/kg	ND	330	04/20/18 12:32	
Phenol	ug/kg	ND	330	04/20/18 12:32	
Pyrene	ug/kg	ND	330	04/20/18 12:32	
2,4,6-Tribromophenol (S)	%	70	60-125	04/20/18 12:32	
2-Fluorobiphenyl (S)	%	71	30-132	04/20/18 12:32	
2-Fluorophenol (S)	%	71	40-125	04/20/18 12:32	
Nitrobenzene-d5 (S)	%	68	43-125	04/20/18 12:32	
p-Terphenyl-d14 (S)	%	94	62-125	04/20/18 12:32	
Phenol-d6 (S)	%	70	48-125	04/20/18 12:32	

LABORATORY CONTROL SAMPLE: 2897278

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1180	71	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1200	72	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1380	83	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1190	72	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1180	71	39-125	
1-Methylnaphthalene	ug/kg	1670	1210	72	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1300	78	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1370	82	61-125	
2,4-Dichlorophenol	ug/kg	1670	1270	76	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE: 2897278

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1240	74	51-125	
2,4-Dinitrophenol	ug/kg	1670	943	57	30-132	6M
2,4-Dinitrotoluene	ug/kg	1670	1410	85	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1360	81	63-125	
2-Chloronaphthalene	ug/kg	1670	1240	74	61-125	
2-Chlorophenol	ug/kg	1670	1200	72	46-125	
2-Methylnaphthalene	ug/kg	1670	1200	72	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1200	72	50-125	
2-Nitroaniline	ug/kg	1670	1410	85	61-125	
2-Nitrophenol	ug/kg	1670	1270	76	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1300	78	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1230	74	47-125	6M
3-Nitroaniline	ug/kg	1670	1260	75	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1330J	80	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1340	80	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1270	76	64-125	
4-Chloroaniline	ug/kg	1670	1130	68	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1270	76	64-125	
4-Nitroaniline	ug/kg	1670	1440	86	59-125	
4-Nitrophenol	ug/kg	1670	1360	82	54-125	
Acenaphthene	ug/kg	1670	1250	75	62-125	
Acenaphthylene	ug/kg	1670	1280	77	61-125	
Anthracene	ug/kg	1670	1320	79	66-125	
Benzo(a)anthracene	ug/kg	1670	1360	82	69-125	
Benzo(a)pyrene	ug/kg	1670	1350	81	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1330	80	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1430	86	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1360	82	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1230	74	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1190	72	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1240	74	37-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1470	88	69-131	
Butylbenzylphthalate	ug/kg	1670	1430	86	69-129	
Carbazole	ug/kg	1670	1340	80	66-125	
Chrysene	ug/kg	1670	1380	83	68-125	
Di-n-butylphthalate	ug/kg	1670	1410	85	69-125	
Di-n-octylphthalate	ug/kg	1670	1460	87	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1420	85	64-125	
Dibenzofuran	ug/kg	1670	1260	76	65-125	
Diethylphthalate	ug/kg	1670	1340	81	67-125	
Dimethylphthalate	ug/kg	1670	1340	81	67-125	
Fluoranthene	ug/kg	1670	1340	81	66-125	
Fluorene	ug/kg	1670	1280	77	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1220	73	40-125	
Hexachlorobenzene	ug/kg	1670	1320	79	62-125	
Hexachloroethane	ug/kg	1670	1210	73	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1400	84	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

LABORATORY CONTROL SAMPLE: 2897278

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1230	74	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1210	72	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1200	72	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1350	81	65-125	
Naphthalene	ug/kg	1670	1190	71	48-125	
Nitrobenzene	ug/kg	1670	1260	75	48-125	
Pentachlorophenol	ug/kg	1670	1230	74	41-125	
Phenanthrene	ug/kg	1670	1320	79	66-125	
Phenol	ug/kg	1670	1250	75	46-125	
Pyrene	ug/kg	1670	1410	85	69-125	
2,4,6-Tribromophenol (S)	%			75	60-125	
2-Fluorobiphenyl (S)	%			71	30-132	
2-Fluorophenol (S)	%			71	40-125	
Nitrobenzene-d5 (S)	%			69	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			68	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897279 2897280

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427355002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	1870	1850	1170	1150	63	62	30-127	2	30	
1,2-Dichlorobenzene	ug/kg	ND	1870	1850	1120	1080	60	58	30-125	4	30	
1,2-Diphenylhydrazine	ug/kg	ND	1870	1850	1490	1450	80	78	30-150	3	30	
1,3-Dichlorobenzene	ug/kg	ND	1870	1850	1080	1100	58	60	30-125	2	30	
1,4-Dichlorobenzene	ug/kg	ND	1870	1850	1060	1040	57	56	30-125	2	30	
1-Methylnaphthalene	ug/kg	ND	1870	1850	1270	1280	68	69	42-125	1	30	
2,4,5-Trichlorophenol	ug/kg	ND	1870	1850	1490	1470	80	79	30-150	1	30	
2,4,6-Trichlorophenol	ug/kg	ND	1870	1850	1410	1420	76	76	30-150	0	30	
2,4-Dichlorophenol	ug/kg	ND	1870	1850	1410	1350	76	73	30-135	4	30	
2,4-Dimethylphenol	ug/kg	ND	1870	1850	1290	1350	69	73	30-148	4	30	
2,4-Dinitrophenol	ug/kg	ND	1870	1850	923	728	50	39	30-125	24	30	6M
2,4-Dinitrotoluene	ug/kg	ND	1870	1850	1550	1500	83	81	30-150	3	30	
2,6-Dinitrotoluene	ug/kg	ND	1870	1850	1530	1510	82	82	30-150	1	30	
2-Chloronaphthalene	ug/kg	ND	1870	1850	1380	1370	74	74	30-138	1	30	
2-Chlorophenol	ug/kg	ND	1870	1850	1230	1180	66	63	30-130	4	30	
2-Methylnaphthalene	ug/kg	ND	1870	1850	1270	1240	68	67	46-125	2	30	
2-Methylphenol(o-Cresol)	ug/kg	ND	1870	1850	1310	1260	70	68	30-133	3	30	
2-Nitroaniline	ug/kg	ND	1870	1850	1580	1550	85	84	30-150	2	30	
2-Nitrophenol	ug/kg	ND	1870	1850	1140	1240	61	67	30-134	8	30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1870	1850	1270	1220	68	66	30-138	4	30	
3,3'-Dichlorobenzidine	ug/kg	ND	1870	1850	1410	1510	76	82	30-149	7	30	6M
3-Nitroaniline	ug/kg	ND	1870	1850	1330	1360	71	73	30-150	2	30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1870	1850	1380J	1150J	74	62	30-133		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897279												2897280											
Parameter	Units	MS		MSD		MS		MSD		% Rec		Max		Qual									
		10427355002	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD												
4-Bromophenylphenyl ether	ug/kg	ND	1870	1850	1530	1480	82	80	44-125	4	30												
4-Chloro-3-methylphenol	ug/kg	ND	1870	1850	1430	1390	77	75	30-150	3	30												
4-Chloroaniline	ug/kg	ND	1870	1850	1000	1110	54	60	30-125	11	30												
4-Chlorophenylphenyl ether	ug/kg	ND	1870	1850	1330	1400	71	76	44-125	5	30												
4-Nitroaniline	ug/kg	ND	1870	1850	1490	1490	80	80	30-150	0	30												
4-Nitrophenol	ug/kg	ND	1870	1850	1560	1450	84	78	30-150	7	30												
Acenaphthene	ug/kg	ND	1870	1850	1390	1330	74	72	40-125	4	30												
Acenaphthylene	ug/kg	ND	1870	1850	1410	1400	76	75	30-150	0	30												
Anthracene	ug/kg	ND	1870	1850	1490	1490	80	80	30-150	0	30												
Benzo(a)anthracene	ug/kg	ND	1870	1850	1540	1570	83	85	30-150	2	30												
Benzo(a)pyrene	ug/kg	ND	1870	1850	1510	1510	81	81	30-150	0	30												
Benzo(b)fluoranthene	ug/kg	ND	1870	1850	1570	1600	84	87	30-150	2	30												
Benzo(g,h,i)perylene	ug/kg	ND	1870	1850	1620	1600	87	86	30-150	1	30												
Benzo(k)fluoranthene	ug/kg	ND	1870	1850	1500	1500	81	81	30-150	0	30												
bis(2-Chloroethoxy)methane	ug/kg	ND	1870	1850	1240	1270	67	68	30-134	2	30												
bis(2-Chloroethyl) ether	ug/kg	ND	1870	1850	1170	1120	63	61	30-125	4	30												
bis(2-Chloroisopropyl) ether	ug/kg	ND	1870	1850	1170	1090	63	59	30-125	6	30												
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1870	1850	1630	1590	88	86	30-150	3	30												
Butylbenzylphthalate	ug/kg	ND	1870	1850	1660	1570	89	85	30-150	5	30												
Carbazole	ug/kg	ND	1870	1850	1510	1490	81	80	41-125	2	30												
Chrysene	ug/kg	ND	1870	1850	1560	1570	84	85	30-150	1	30												
Di-n-butylphthalate	ug/kg	ND	1870	1850	1520	1540	82	83	30-150	1	30												
Di-n-octylphthalate	ug/kg	ND	1870	1850	1630	1570	88	85	30-150	4	30												
Dibenz(a,h)anthracene	ug/kg	ND	1870	1850	1530	1500	82	81	30-150	1	30												
Dibenzofuran	ug/kg	ND	1870	1850	1400	1400	75	75	45-125	0	30												
Diethylphthalate	ug/kg	ND	1870	1850	1450	1490	78	81	30-150	3	30												
Dimethylphthalate	ug/kg	ND	1870	1850	1470	1380	79	75	30-150	6	30												
Fluoranthene	ug/kg	ND	1870	1850	1490	1590	80	86	30-150	6	30												
Fluorene	ug/kg	ND	1870	1850	1450	1390	78	75	30-150	4	30												
Hexachloro-1,3-butadiene	ug/kg	ND	1870	1850	1160	1140	62	61	30-128	2	30												
Hexachlorobenzene	ug/kg	ND	1870	1850	1520	1470	81	79	30-150	3	30												
Hexachloroethane	ug/kg	ND	1870	1850	1170	1080	63	59	30-125	8	30												
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1870	1850	1580	1570	85	85	30-150	1	30												
Isophorone	ug/kg	ND	1870	1850	1260	1240	68	67	30-140	1	30												
N-Nitroso-di-n-propylamine	ug/kg	ND	1870	1850	1220	1120	65	61	30-147	8	30												
N-Nitrosodimethylamine	ug/kg	ND	1870	1850	1210	1050	65	56	30-125	15	30												
N-Nitrosodiphenylamine	ug/kg	ND	1870	1850	1480	1500	80	81	30-150	1	30												
Naphthalene	ug/kg	ND	1870	1850	1170	1170	63	63	44-125	0	30												
Nitrobenzene	ug/kg	ND	1870	1850	1220	1200	65	64	30-136	2	30												
Pentachlorophenol	ug/kg	ND	1870	1850	1230	1260	66	68	30-150	2	30												
Phenanthrene	ug/kg	ND	1870	1850	1510	1540	81	83	30-150	2	30												
Phenol	ug/kg	ND	1870	1850	1230	1180	66	64	30-129	4	30												
Pyrene	ug/kg	ND	1870	1850	1650	1750	89	95	30-150	6	30												
2,4,6-Tribromophenol (S)	%						74	73	60-125														
2-Fluorobiphenyl (S)	%						68	68	30-132														
2-Fluorophenol (S)	%						59	55	40-125														

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897279		2897280		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427355002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrobenzene-d5 (S)	%.					58	57	43-125			
p-Terphenyl-d14 (S)	%.					87	83	62-125			
Phenol-d6 (S)	%.					63	59	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532788 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2893351 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/18/18 11:32	
Acenaphthylene	ug/kg	ND	10.0	04/18/18 11:32	
Anthracene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(a)anthracene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(a)pyrene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/18/18 11:32	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/18/18 11:32	
Chrysene	ug/kg	ND	10.0	04/18/18 11:32	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/18/18 11:32	
Fluoranthene	ug/kg	ND	10.0	04/18/18 11:32	
Fluorene	ug/kg	ND	10.0	04/18/18 11:32	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/18/18 11:32	
Naphthalene	ug/kg	ND	10.0	04/18/18 11:32	
Phenanthrene	ug/kg	ND	10.0	04/18/18 11:32	
Pyrene	ug/kg	ND	10.0	04/18/18 11:32	
2-Fluorobiphenyl (S)	%	83	42-125	04/18/18 11:32	
p-Terphenyl-d14 (S)	%	99	57-125	04/18/18 11:32	

LABORATORY CONTROL SAMPLE: 2893353

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.2	73	52-125	
Acenaphthylene	ug/kg	33.3	25.6	77	50-125	
Anthracene	ug/kg	33.3	27.5	82	65-125	
Benzo(a)anthracene	ug/kg	33.3	28.8	86	60-125	
Benzo(a)pyrene	ug/kg	33.3	28.3	85	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	31.7	95	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	31.0	93	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	29.4	88	67-125	
Chrysene	ug/kg	33.3	28.8	86	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	33.4	100	63-125	
Fluoranthene	ug/kg	33.3	28.9	87	75-125	
Fluorene	ug/kg	33.3	26.1	78	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	32.3	97	63-125	
Naphthalene	ug/kg	33.3	24.3	73	49-125	
Phenanthrene	ug/kg	33.3	27.0	81	65-125	
Pyrene	ug/kg	33.3	29.4	88	64-125	
2-Fluorobiphenyl (S)	%			79	42-125	
p-Terphenyl-d14 (S)	%			94	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Parameter	Units	10427477002		2893354		2893355		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Acenaphthene	ug/kg	ND	37.1	37.2	34.5J	109	93	293	30-125			30	M1	
Acenaphthylene	ug/kg	ND	37.1	37.2	43.4J	47.1J	117	127	30-133			30		
Anthracene	ug/kg	ND	37.1	37.2	65.4	180	176	483	30-150	93		30	M1,R1	
Benzo(a)anthracene	ug/kg	0.12	37.1	37.2	163	365	117	662	30-150	77		30	M1,R1	
Benzo(a)pyrene	ug/kg	0.14	37.1	37.2	179	374	114	638	30-150	71		30	M1,R1	
Benzo(b)fluoranthene	ug/kg	0.16	37.1	37.2	212	478	152	868	30-150	77		30	M1,R1	
Benzo(g,h,i)perylene	ug/kg	0.13	37.1	37.2	173	316	125	509	30-150	58		30	M1,R1	
Benzo(k)fluoranthene	ug/kg	0.068	37.1	37.2	78.1	176	26	290	30-150	77		30	M1,R1	
Chrysene	ug/kg	0.11	37.1	37.2	158	365	120	676	30-150	79		30	M1,R1	
Dibenz(a,h)anthracene	ug/kg	ND	37.1	37.2	96.2	128	259	344	30-131	28		30	M1	
Fluoranthene	ug/kg	0.24	37.1	37.2	291	825	134	1570	30-150	96		30	M1,R1	
Fluorene	ug/kg	ND	37.1	37.2	40.2J	92.1	108	248	30-147			30	M1	
Indeno(1,2,3-cd)pyrene	ug/kg	0.077	37.1	37.2	119	234	113	422	30-150	65		30	M1,R1	
Naphthalene	ug/kg	ND	37.1	37.2	28.2J	47J	76	126	30-131			30		
Phenanthrene	ug/kg	0.12	37.1	37.2	160	618	113	1340	30-150	118		30	M1,R1	
Pyrene	ug/kg	0.22	37.1	37.2	276	691	145	1260	30-150	86		30	M1,R1	
2-Fluorobiphenyl (S)	%.						81	84	42-125				D3	
p-Terphenyl-d14 (S)	%.						94	98	57-125					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 532497 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2891856 Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/19/18 17:29	
n-Triacontane (S)	%.	110	50-150	04/19/18 17:29	

LABORATORY CONTROL SAMPLE & LCSD: 2891857

2891858

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	77.3	77.6	97	97	70-120	0	20	
n-Triacontane (S)	%.				104	99	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 438492 Analysis Method: EPA 7196A
 QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 2026403 Matrix: Solid
 Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/24/18 13:00	

LABORATORY CONTROL SAMPLE: 2026404

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1010	924	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026421 2026422

Parameter	Units	10427291008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1080	1150	839	962	77	84	75-125	14	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026423 2026424

Parameter	Units	10427291008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	42.9	42.7	28.6	29.2	67	68	75-125	2	20	M3

SAMPLE DUPLICATE: 2026425

Parameter	Units	10427354004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 286553

Analysis Method: EPA 9012

QC Batch Method: EPA 9012A

Analysis Description: 9012 Cyanide

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 1676305

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/20/18 13:32	

LABORATORY CONTROL SAMPLE: 1676306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676307 1676308

Parameter	Units	40167646001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.10J	2.22	2.34	2.3	2.4	98	99	80-120	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676309 1676310

Parameter	Units	10427291004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	mg/kg	0.67	3.98	3.65	4.2	3.7	88	82	80-120	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

QC Batch: 140842

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

METHOD BLANK: 557419

Matrix: Solid

Associated Lab Samples: 10427354001, 10427354002, 10427354003, 10427354004, 10427354005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/19/18 16:14	

LABORATORY CONTROL SAMPLE: 557418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	52.6	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557420 557421

Parameter	Units	10427291004 Result	MS	MSD	MS Result	MSD	MS % Rec	MSD	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.		Result		% Rec				
Fluoride	mg/kg	1.4	49.8	49.8	12.1	12.9	21	23	80-120	7	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557422 557423

Parameter	Units	10427291008 Result	MS	MSD	MS Result	MSD	MS % Rec	MSD	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.		Result		% Rec				
Fluoride	mg/kg	ND	49.7	49	35.4	35.5	69	71	80-120	0	20	M1

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10427354

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
 ND - Not Detected at or above adjusted reporting limit.
 TNTC - Too Numerous To Count
 J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
 MDL - Adjusted Method Detection Limit.
 PQL - Practical Quantitation Limit.
 RL - Reporting Limit.
 S - Surrogate
 1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
 Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
 LCS(D) - Laboratory Control Sample (Duplicate)
 MS(D) - Matrix Spike (Duplicate)
 DUP - Sample Duplicate
 RPD - Relative Percent Difference
 NC - Not Calculable.
 SG - Silica Gel - Clean-Up
 U - Indicates the compound was analyzed for, but not detected.
 N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
 Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
 TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth
 PASI-G Pace Analytical Services - Green Bay
 PASI-I Pace Analytical Services - Indianapolis
 PASI-M Pace Analytical Services - Minneapolis
 PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M Sample was black in color and slightly viscous.
 2M Sample was black in color and viscous. Sample was centrifuged and decanted prior to analysis.
 3M Sample was black in color.
 4M Sample was dark brown in color.
 5M Sample was yellow in color.
 6M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
 CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
 D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
 D4 Sample was diluted due to the presence of high levels of target analytes.
 L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
 M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
 M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

ANALYTE QUALIFIERS

- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
- T6 High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10427354

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427354001	TS-SB-04 (7-15 WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427354002	TS-SB-05 (5-7.5 WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427354003	TS-SB-06 (8-12.5WM)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427354004	TS-SB-07 (15.18.5)	EPA 1630 (1998)	141622	EPA 1630 (1998)	141625
10427354005	TS-SB-08 (10-20WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427354001	TS-SB-04 (7-15 WM)	EPA 3550	532491	EPA 8081B	532802
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3550	532491	EPA 8081B	532802
10427354003	TS-SB-06 (8-12.5WM)	EPA 3550	532491	EPA 8081B	532802
10427354004	TS-SB-07 (15.18.5)	EPA 3550	532491	EPA 8081B	532802
10427354005	TS-SB-08 (10-20WM)	EPA 3550	532491	EPA 8081B	532802
10427354001	TS-SB-04 (7-15 WM)	EPA 3550	532605	EPA 8082A	532864
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3550	532605	EPA 8082A	532864
10427354003	TS-SB-06 (8-12.5WM)	EPA 3550	532605	EPA 8082A	532864
10427354004	TS-SB-07 (15.18.5)	EPA 3550	532605	EPA 8082A	532864
10427354005	TS-SB-08 (10-20WM)	EPA 3550	532605	EPA 8082A	532864
10427354001	TS-SB-04 (7-15 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427354002	TS-SB-05 (5-7.5 WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427354003	TS-SB-06 (8-12.5WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427354004	TS-SB-07 (15.18.5)	WI MOD DRO	532497	WI MOD DRO	532700
10427354005	TS-SB-08 (10-20WM)	WI MOD DRO	532497	WI MOD DRO	532700
10427354001	TS-SB-04 (7-15 WM)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354002	TS-SB-05 (5-7.5 WM)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354003	TS-SB-06 (8-12.5WM)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354004	TS-SB-07 (15.18.5)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354005	TS-SB-08 (10-20WM)	EPA 5030 Medium Soil	534067	WI MOD GRO	534264
10427354001	TS-SB-04 (7-15 WM)	EPA 3050	532662	EPA 6010C	532713
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3050	532662	EPA 6010C	532713
10427354003	TS-SB-06 (8-12.5WM)	EPA 3050	532662	EPA 6010C	532713
10427354004	TS-SB-07 (15.18.5)	EPA 3050	532662	EPA 6010C	532713
10427354005	TS-SB-08 (10-20WM)	EPA 3050	532662	EPA 6010C	532713
10427354001	TS-SB-04 (7-15 WM)	EPA 3050B	437531	EPA 6020	438359
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3050B	437531	EPA 6020	438359
10427354003	TS-SB-06 (8-12.5WM)	EPA 3050B	437531	EPA 6020	438359
10427354004	TS-SB-07 (15.18.5)	EPA 3050B	437531	EPA 6020	438359
10427354005	TS-SB-08 (10-20WM)	EPA 3050B	437531	EPA 6020	438359
10427354001	TS-SB-04 (7-15 WM)	EPA 3050	532660	EPA 6020A	532720
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3050	532660	EPA 6020A	532720
10427354003	TS-SB-06 (8-12.5WM)	EPA 3050	532660	EPA 6020A	532720
10427354004	TS-SB-07 (15.18.5)	EPA 3050	532660	EPA 6020A	532720
10427354005	TS-SB-08 (10-20WM)	EPA 3050	532660	EPA 6020A	532720
10427354001	TS-SB-04 (7-15 WM)	EPA 7471	533671	EPA 7471	533807
10427354002	TS-SB-05 (5-7.5 WM)	EPA 7471	533671	EPA 7471	533807
10427354003	TS-SB-06 (8-12.5WM)	EPA 7471	533671	EPA 7471	533807
10427354004	TS-SB-07 (15.18.5)	EPA 7471	533671	EPA 7471	533807

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10427354

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427354005	TS-SB-08 (10-20WM)	EPA 7471	533671	EPA 7471	533807
10427354001	TS-SB-04 (7-15 WM)	ASTM D2974	533197		
10427354002	TS-SB-05 (5-7.5 WM)	ASTM D2974	533197		
10427354003	TS-SB-06 (8-12.5WM)	ASTM D2974	533197		
10427354004	TS-SB-07 (15.18.5)	ASTM D2974	533197		
10427354005	TS-SB-08 (10-20WM)	ASTM D2974	533197		
10427354001	TS-SB-04 (7-15 WM)	EPA 3550	533361	EPA 8270D	533537
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3550	533361	EPA 8270D	533537
10427354003	TS-SB-06 (8-12.5WM)	EPA 3550	533361	EPA 8270D	533537
10427354004	TS-SB-07 (15.18.5)	EPA 3550	533361	EPA 8270D	533537
10427354005	TS-SB-08 (10-20WM)	EPA 3550	533361	EPA 8270D	533537
10427354001	TS-SB-04 (7-15 WM)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354003	TS-SB-06 (8-12.5WM)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354004	TS-SB-07 (15.18.5)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354005	TS-SB-08 (10-20WM)	EPA 3550	532788	EPA 8270D by SIM	532973
10427354001	TS-SB-04 (7-15 WM)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354002	TS-SB-05 (5-7.5 WM)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354003	TS-SB-06 (8-12.5WM)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354004	TS-SB-07 (15.18.5)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354005	TS-SB-08 (10-20WM)	EPA 5035/5030B	534064	EPA 8260B	534331
10427354001	TS-SB-04 (7-15 WM)	EPA 3060A	438492	EPA 7196A	438766
10427354002	TS-SB-05 (5-7.5 WM)	EPA 3060A	438492	EPA 7196A	438766
10427354003	TS-SB-06 (8-12.5WM)	EPA 3060A	438492	EPA 7196A	438766
10427354004	TS-SB-07 (15.18.5)	EPA 3060A	438492	EPA 7196A	438766
10427354005	TS-SB-08 (10-20WM)	EPA 3060A	438492	EPA 7196A	438766
10427354001	TS-SB-04 (7-15 WM)	Trivalent Chromium Calculation	439198		
10427354002	TS-SB-05 (5-7.5 WM)	Trivalent Chromium Calculation	439198		
10427354003	TS-SB-06 (8-12.5WM)	Trivalent Chromium Calculation	439198		
10427354004	TS-SB-07 (15.18.5)	Trivalent Chromium Calculation	439198		
10427354005	TS-SB-08 (10-20WM)	Trivalent Chromium Calculation	439198		
10427354001	TS-SB-04 (7-15 WM)	EPA 9012A	286553	EPA 9012	286614
10427354002	TS-SB-05 (5-7.5 WM)	EPA 9012A	286553	EPA 9012	286614
10427354003	TS-SB-06 (8-12.5WM)	EPA 9012A	286553	EPA 9012	286614
10427354004	TS-SB-07 (15.18.5)	EPA 9012A	286553	EPA 9012	286614
10427354005	TS-SB-08 (10-20WM)	EPA 9012A	286553	EPA 9012	286614
10427354001	TS-SB-04 (7-15 WM)	EPA 300.0	140842	EPA 9056A	140851
10427354002	TS-SB-05 (5-7.5 WM)	EPA 300.0	140842	EPA 9056A	140851
10427354003	TS-SB-06 (8-12.5WM)	EPA 300.0	140842	EPA 9056A	140851
10427354004	TS-SB-07 (15.18.5)	EPA 300.0	140842	EPA 9056A	140851
10427354005	TS-SB-08 (10-20WM)	EPA 300.0	140842	EPA 9056A	140851

REPORT OF LABORATORY ANALYSIS

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10427354

Minnesota Pollution Control Agency		Chain-of-Custody Form				Work Order Number:		COC Type:		Page: 1 of				
PROJECT/CLIENT INFO						Turnaround Time:		COC ID:		FOR LAB USE ONLY				
Facility Code: <i>MPCA-Freeway LF solids</i>		Program Code (MDH Lab Only):		Lab Name:		Address: <i>18-00383</i>		Project Name: <i>MPCA-Freeway LF solids</i>		Project Task Code:				
Project Manager:		Potential Hazard?		If yes, add information to Sampler Comments Section		Phone No:		Address: <i>EPIC Profile #38716</i>		Lab Work Order Sticker				
SAMPLE DETAILS						ANALYSIS REQUESTED								
SAMPLE TYPE CODES			LAB MATRIX CODES			FIELD MATRIX CODES			ANALYSIS REQUESTED					
S-Routine Sample S-IVP-Integrated Vertical Profile Sample S-CWOP-Composite Sample			QC-FB-Field Blank Sample QC-FR-Field Replicate Sample QC-TB-Trip Blank Sample			DW-Drinking Water NW-Non-potable Water SD-Soil/Solid WP-Wipe AR-Air BL-Biological Material OT-Other TS-Tissue			Wt-Groundwater Ww-Surface Water QC-BLANK-Artificial Blank Water Leachate=Leachate Sample			ANALYSIS REQUESTED		
Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	Lab Sample No.	#
<i>13-5B-04 (7-15 Wm)</i>	<i>S</i>	<i>4/13/18</i>	<i>0900</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>001</i>	<i>1</i>
<i>13-5B-05 (21-24 S)</i>	<i>S</i>	<i>4/13/18</i>	<i>1010</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>2</i>
<i>13-5B-06 (5-7.5 Wm)</i>	<i>S</i>	<i>4/13/18</i>	<i>1010</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>002</i>	<i>4</i>
<i>13-5B-06 (8-12.5 Wm)</i>	<i>S</i>	<i>4/13/18</i>	<i>1105</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>003</i>	<i>5</i>
<i>13-5B-07 (15-19 S)</i>	<i>S</i>	<i>4/13/18</i>	<i>1220</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>004</i>	<i>6</i>
<i>13-5B-08 (10-20 Wm)</i>	<i>S</i>	<i>4/13/18</i>	<i>1410</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>005</i>	<i>7</i>
														<i>8</i>
														<i>9</i>
														<i>10</i>
Sampled By: <i>David Anderson</i>						Sampler's Signature: <i>David Anderson</i>			Phone #:					
Receiving Comments:														
Relinquished By/Affiliation						Date/Time			Accepted By/Affiliation			Date/Time		
<i>David Anderson / Pace Analytical</i>						<i>4/13/18/1630</i>			<i>Matt Pace</i>			<i>4/13/18 1630</i>		

OJA 4/13/18

see attached for soil tests (+ Dioxins)

1630 T-3.8

	Document Name: Sample Condition Upon Receipt Form	Document Revised: 14Dec2017 Page 1 of 2
	Document No.: F-MN-L-213-rev.22	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt **Client Name:** MN POLLUTION AGENCY **Project #:** _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

WO# : 10427354

PM: JMA **Due Date: 04/27/18**

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 3.6 **Cooler Temp Corrected (°C):** 3.8 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** 4/13/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 04/16/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately
 half of the samples. To be determined in the field by MPCA staff.

Chain of Custody

WO# : 12107162



12107162

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427354 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis																							
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					Fluoride by method 9056																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved											Preserved Containers				LAB USE ONLY									
1	TS-SB-04 (7-15 WM)	PS	4/13/2018 09:00	10427354001	Solid	1																								
2	TS-SB-05 (5-7.5 WM)	PS	4/13/2018 10:10	10427354002	Solid	1																								
3	TS-SB-06 (8-12.5WM)	PS	4/13/2018 11:05	10427354003	Solid	1																								
4	TS-SB-07 (15.18.5)	PS	4/13/2018 12:20	10427354004	Solid	1																								
5	TS-SB-08 (10-20WM)	PS	4/13/2018 14:10	10427354005	Solid	1																								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/16/18 17:15	<i>[Signature]</i> CB	4/16/18 17:45	
2	<i>[Signature]</i>	4/16/18 21:30	B. Mathias	4/17/18 0700	
3					

Cooler Temperature on Receipt 56 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace - MPLS. Project #: _____

WO# : 12107162
 PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.3 Cooler Temp Corrected °C: 5.4 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 4/20/18 CRB

Comments: Bm 4/17/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Angela Hill Date: 4/17/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

401675-41



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427354

Workorder Name: 18-00383 MPCA Freeway LF Solid

Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To		Requested Analysis																				
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Total Cyanide by 9012	LAB USE ONLY												
						Unpreserved																		
1	TS-SB-04 (7-15 WM) 001	PS	4/13/2018 09:00	10427354001	Solid	1						X												
2	TS-SB-05 (5-7.5 WM) 002	PS	4/13/2018 10:10	10427354002	Solid	1						X												
3	TS-SB-06 (8-12.5 WM) 003	PS	4/13/2018 11:05	10427354003	Solid	1						X												
4	TS-SB-07 (15.18.5) 004	PS	4/13/2018 12:20	10427354004	Solid	1						X												
5	TS-SB-08 (10-20 WM) 005	PS	4/13/2018 14:10	10427354005	Solid	1						X												


Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/16/18 17:00	<i>[Signature]</i>	4/17/18 09:01	
2	<i>[Signature]</i>	4/17/18 09:01	<i>[Signature]</i>	4/17/18 09:01	
3					

Cooler Temperature on Receipt 2 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN
Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Project #: _____
WO#: 40167541

40167541

Tracking #: 1643529-1
Custody Seal on Cooler/Box Present: yes no Seals intact: yes no
Custody Seal on Samples Present: yes no Seals intact: yes no
Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used SR-75 **Type of Ice:** Wet Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature Uncorr: 2 / Corr: 2

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no
Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 4/17/18
Initials: SM

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>TRUD</u> <u>SM 4/17/18</u>
Samples Arrived within Hold Time: - VOA Samples frozen upon receipt	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No	5. Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used: -Pace Containers Used: -Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: <u>5</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>client label has no collect times</u> <u>SM 4/17/18</u>
Trip Blank Present: Trip Blank Custody Seals Present Pace Trip Blank Lot # (if purchased):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____ If checked, see attached form for additional comments
Comments/ Resolution: _____

Project Manager Review: Cia **Date:** 4/17/18

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO# : 12107162

PM: HRZ Due Date: 04/27/18
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.9 Cooler Temp Corrected °C: 5.9 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/17/18 *[Signature]*

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194568

Date/Time and Initials of person examining contents: 7/2 4/12/18 0945

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 7632 1990

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N

Cooler Temperature: 2.1/2.3 Ice Visible in Sample Containers?: Yes No N

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			/
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments:

Sample Container Count

WO#: 50194568



50194568

CLIENT: Page MN

COC PAGE 1 of 1

COC ID# _____

Project # 50194568

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGUFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	SBS DI	Bulk Kit	Matrix Si/W (Soil/Water/ Aqueous Li	pH <2	pH >9	pH >1	
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG9U	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WG9U	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 25, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427354
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TS-SB-04 (7-15 WM) (10427354001)	A181608-01	Solid	04/13/2018	04/17/2018
TS-SB-05 (5-7.5 WM) (10427354002)	A181608-02	Solid	04/13/2018	04/17/2018
TS-SB-06 (8-12.5WM) (10427354003)	A181608-03	Solid	04/13/2018	04/17/2018
TS-SB-07 (15.18.5) (10427354004)	A181608-04	Solid	04/13/2018	04/17/2018
TS-SB-08 (10-20WM) (10427354005)	A181608-05	Solid	04/13/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

5 samples were received on 04/17/2018. Samples were received at 4.8 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Additional Comments:

Sample A181608-05 had to be run at an initial dilution factor of 1:50 for the MDA List II analysis, due to the sample matrix. The reporting limits have been raised accordingly.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427354
 Project Manager: Jennifer Anderson

TS-SB-04 (7-15 WM) (10427354001)

A181608-01 (Solid)

Date Sampled
04/13/2018 09:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804172

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 09:38	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 10:36	EPA 8321B	

Surrogate: DCAA 91.6 % 70.8-116 04/20/2018 04/22/2018 10:36 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804164

% Solids	86.5	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427354 Project Manager: Jennifer Anderson
--	--

TS-SB-06 (8-12.5WM) (10427354003)

Date Sampled
04/13/2018 11:05

A181608-03 (Solid)

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804172

2,4-D	0.29	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	P
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
2,4,5-T	0.18	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	
Triclopyr	0.22	0.10	mg/kg dry	1	04/20/2018	04/22/2018 12:51	EPA 8321B	

Surrogate: DCAA

90.8 % 70.8-116 04/20/2018 04/22/2018 12:51 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804164

% Solids	82.7	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427354 Project Manager: Jennifer Anderson
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TS-SB-07 (15.18.5) (10427354004)
A181608-04 (Solid)

Date Sampled
 04/13/2018 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804172

2,4-D	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 01:57	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/20/2018	04/22/2018 02:47	EPA 8321B	

Surrogate: DCAA 98.1 % 70.8-116 04/20/2018 04/22/2018 02:47 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804164

% Solids	92.7	0.00	% by Weight	1	04/18/2018	04/19/2018 11:20	SM 2540B	
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2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427354
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804172 - EPA 3570

Blank (A804172-BLK1)										
Prepared: 04/20/2018 Analyzed: 04/22/2018 01:40										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	20.0		mg/kg wet	20.00		99.9	70.8-116			
Surrogate: DCAA [2C]	19.0		mg/kg wet	20.00		95.1	62.3-114			

LCS (A804172-BS1)										
Prepared: 04/20/2018 Analyzed: 04/22/2018 00:33										
2,4-D	1.88	0.10	mg/kg wet	2.000		94.2	81.6-107			
2,4-D [2C]	1.80	0.10	mg/kg wet	2.000		90.0	71.8-120			
2,4-DB	1.78	0.10	mg/kg wet	2.000		89.2	76.4-107			
2,4-DB [2C]	1.67	0.10	mg/kg wet	2.000		83.4	62.2-129			
2,4,5-T	1.95	0.10	mg/kg wet	2.000		97.3	81.2-110			
2,4,5-T [2C]	1.79	0.10	mg/kg wet	2.000		89.7	70.6-125			
2,4,5-TP	1.85	0.10	mg/kg wet	2.000		92.5	79.1-106			
2,4,5-TP [2C]	1.65	0.10	mg/kg wet	2.000		82.5	68.2-118			
Bentazon	1.00	0.10	mg/kg wet	1.000		100	82.5-119			
Bentazon [2C]	1.06	0.10	mg/kg wet	1.000		106	73.3-125			
Dicamba	1.90	0.10	mg/kg wet	2.000		95.2	85.1-108			
Dicamba [2C]	1.84	0.10	mg/kg wet	2.000		91.8	71.4-115			
Picloram	0.967	0.10	mg/kg wet	1.000		96.7	86.1-106			
Picloram [2C]	0.860	0.10	mg/kg wet	1.000		86.0	74.5-114			
Triclopyr	1.85	0.10	mg/kg wet	2.000		92.6	78.6-106			
Triclopyr [2C]	1.69	0.10	mg/kg wet	2.000		84.6	69.4-118			
Surrogate: DCAA	20.3		mg/kg wet	20.00		101	70.8-116			
Surrogate: DCAA [2C]	17.8		mg/kg wet	20.00		89.2	62.3-114			

LCS (A804172-BS2)										
Prepared: 04/20/2018 Analyzed: 04/21/2018 23:26										
MCPA	2.15	0.10	mg/kg wet	2.000		108	79.4-116			
MCPA [2C]	1.90	0.10	mg/kg wet	2.000		95.1	77-123			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427354
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804172 - EPA 3570

LCS (A804172-BS2)

Prepared: 04/20/2018 Analyzed: 04/21/2018 23:26

Surrogate: DCAA	20.6		mg/kg wet	20.00		103	70.8-116			
Surrogate: DCAA [2C]	21.6		mg/kg wet	20.00		108	62.3-114			

Matrix Spike (A804172-MS1)

Source: A181608-04

Prepared: 04/20/2018 Analyzed: 04/22/2018 03:54

2,4-D	1.96	0.10	mg/kg dry	2.158	ND	90.7	71.4-105			
2,4-D [2C]	2.00	0.10	mg/kg dry	2.158	ND	92.9	50.5-123			
2,4-DB	1.84	0.10	mg/kg dry	2.158	ND	85.4	46.4-117			
2,4-DB [2C]	1.93	0.10	mg/kg dry	2.158	ND	89.3	44.5-121			
2,4,5-T	2.00	0.10	mg/kg dry	2.158	ND	92.7	66.2-110			
2,4,5-T [2C]	1.96	0.10	mg/kg dry	2.158	ND	90.8	43.6-126			
2,4,5-TP	1.93	0.10	mg/kg dry	2.158	ND	89.3	52.4-114			
2,4,5-TP [2C]	1.72	0.10	mg/kg dry	2.158	ND	79.9	47.6-117			
Bentazon	1.04	0.10	mg/kg dry	1.079	0.0620	90.6	61.5-117			
Bentazon [2C]	1.19	0.10	mg/kg dry	1.079	ND	110	50.7-127			
Dicamba	1.69	0.10	mg/kg dry	2.158	ND	78.4	48.4-111			
Dicamba [2C]	1.71	0.10	mg/kg dry	2.158	ND	79.3	43.3-108			
Picloram	0.711	0.10	mg/kg dry	1.079	ND	65.9	26.7-110			
Picloram [2C]	0.433	0.10	mg/kg dry	1.079	0.00608	39.5	10.8-110			
Triclopyr	1.95	0.10	mg/kg dry	2.158	ND	90.5	56-113			
Triclopyr [2C]	1.81	0.10	mg/kg dry	2.158	ND	84.0	47.9-120			
Surrogate: DCAA	21.0		mg/kg dry	21.58		97.1	70.8-116			
Surrogate: DCAA [2C]	19.2		mg/kg dry	21.58		88.8	62.3-114			

Matrix Spike (A804172-MS2)

Source: A181608-04

Prepared: 04/20/2018 Analyzed: 04/22/2018 08:22

MCPA	2.20	0.10	mg/kg dry	2.158	ND	102	74.2-114			
MCPA [2C]	2.15	0.10	mg/kg dry	2.158	ND	99.8	60.9-122			
Surrogate: DCAA	21.4		mg/kg dry	21.58		99.3	70.8-116			
Surrogate: DCAA [2C]	21.4		mg/kg dry	21.58		99.0	62.3-114			

Matrix Spike Dup (A804172-MSD1)

Source: A181608-04

Prepared: 04/20/2018 Analyzed: 04/22/2018 05:01

2,4-D	1.96	0.10	mg/kg dry	2.158	ND	90.6	71.4-105	0.123	20	
2,4-D [2C]	2.07	0.10	mg/kg dry	2.158	ND	95.9	50.5-123	3.23	20	
2,4-DB	1.86	0.10	mg/kg dry	2.158	ND	86.3	46.4-117	1.04	20	
2,4-DB [2C]	1.91	0.10	mg/kg dry	2.158	ND	88.4	44.5-121	1.02	20	
2,4,5-T	2.02	0.10	mg/kg dry	2.158	ND	93.4	66.2-110	0.787	20	
2,4,5-T [2C]	1.93	0.10	mg/kg dry	2.158	ND	89.3	43.6-126	1.68	20	
2,4,5-TP	1.94	0.10	mg/kg dry	2.158	ND	90.1	52.4-114	0.957	20	
2,4,5-TP [2C]	1.75	0.10	mg/kg dry	2.158	ND	81.2	47.6-117	1.62	20	
Bentazon	1.05	0.10	mg/kg dry	1.079	0.0620	91.5	61.5-117	0.899	20	
Bentazon [2C]	1.22	0.10	mg/kg dry	1.079	ND	113	50.7-127	2.11	20	
Dicamba	1.71	0.10	mg/kg dry	2.158	ND	79.3	48.4-111	1.10	20	
Dicamba [2C]	1.77	0.10	mg/kg dry	2.158	ND	82.0	43.3-108	3.39	20	
Picloram	0.697	0.10	mg/kg dry	1.079	ND	64.6	26.7-110	2.08	20	
Picloram [2C]	0.462	0.10	mg/kg dry	1.079	0.00608	42.2	10.8-110	6.45	20	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427354
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch A804172 - EPA 3570

Matrix Spike Dup (A804172-MSD1)		Source: A181608-04			Prepared: 04/20/2018 Analyzed: 04/22/2018 05:01					
Triclopyr	1.96	0.10	mg/kg dry	2.158	ND	90.8	56-113	0.393	20	
Triclopyr [2C]	1.83	0.10	mg/kg dry	2.158	ND	84.8	47.9-120	0.917	20	
Surrogate: DCAA	20.9		mg/kg dry	21.58		96.9	70.8-116			
Surrogate: DCAA [2C]	18.9		mg/kg dry	21.58		87.7	62.3-114			
Matrix Spike Dup (A804172-MSD2)		Source: A181608-04			Prepared: 04/20/2018 Analyzed: 04/22/2018 09:29					
MCPA	2.26	0.10	mg/kg dry	2.158	ND	105	74.2-114	2.48	20	
MCPA [2C]	2.20	0.10	mg/kg dry	2.158	ND	102	60.9-122	2.11	20	
Surrogate: DCAA	21.6		mg/kg dry	21.58		100	70.8-116			
Surrogate: DCAA [2C]	22.9		mg/kg dry	21.58		106	62.3-114			



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427354 Project Manager: Jennifer Anderson
--	--

Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch A804164 - % Solids

Duplicate (A804164-DUP1)	Source: A181613-14		Prepared: 04/18/2018 Analyzed: 04/19/2018 11:20							
% Solids	93.3	0.00	% by Weight		97.0			3.88	20	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427354
Project Manager: Jennifer Anderson

Notes and Definitions

- P The difference in the concentrations between the primary and confirmation column was > 40%.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- DO Diluted out.
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

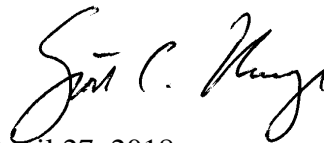
PaceProject#: 10427356
Sample Receipt Date: 04/13/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 27, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 27, 2018

DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 31-72%. Except for one low value, which was flagged "R" on the results table, the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 104%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10427356



10427356

Report No.....10427356_8290TCDD_DFR

Study Form		Work Order Number:		COC Type:		Page: 1 of									
Control Agency		PROJECT/CLIENT INFO		COC ID:		FOR LAB USE ONLY									
Facility Code: <i>MPCA-Freeway LF Solids</i>		Program Code (MDH Lab Only):		LABORATORY		Lab Name:									
Project Name: <i>MPCA-Freeway LF Solids</i>		Project Task Code:		Address: <i>18-00383</i>		Epic Profile # <i>38716</i>									
Project Manager:		Potential Hazard?:		If yes, add information to Sampler Comments Section		Phone No:									
SAMPLE TYPE CODES				SAMPLE DETAILS											
Sample-Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		LAB MATRIX CODES DW=Drinking Water NWS=Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air BL=Biological Material OT=Other TS=Tissue									
FIELD MATRIX CODES Wt-Grnd=Groundwater Wt-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		ANALYSIS REQUESTED		PRESERV.		ANALYSIS									
Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	Lab Sample No.	#
<i>15-SB-04 (7-15 W/M)</i>	<i>S</i>	<i>4/13/18</i>	<i>0910</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>001</i>	<i>1</i>
<i>15-SB-05 (21-24 S)</i>	<i>S</i>	<i>4/13/18</i>	<i>1010</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>X</i>	<i>001</i>	<i>2</i>
<i>15-SB-06 (5-7.5 W/M)</i>	<i>S</i>	<i>4/13/18</i>	<i>1010</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>002</i>	<i>3</i>
<i>15-SB-06 (8-12.5 W/M)</i>	<i>S</i>	<i>4/13/18</i>	<i>1105</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>X</i>	<i>002</i>	<i>4</i>
<i>15-SB-07 (15-19 S)</i>	<i>S</i>	<i>4/13/18</i>	<i>1220</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>		<i>003</i>	<i>5</i>
<i>15-SB-08 (18-20 W/M)</i>	<i>S</i>	<i>4/13/18</i>	<i>1410</i>			<i>C</i>	<i>SD</i>				<i>13</i>	<i>X</i>	<i>X</i>	<i>002</i>	<i>6</i>
															<i>7</i>
															<i>8</i>
															<i>9</i>
															<i>10</i>
Sampled By: <i>Damb Anderson</i>				Sampler's Signature: <i>Damb Anderson</i>				Phone #:							
Receiving Comments:															
Relinquished By/Affiliation				Date/Time				Accepted By/Affiliation				Date/Time			
<i>Damb Anderson / Pace Analytical</i>				<i>4/13/18/1630</i>				<i>Matt Pace</i>				<i>4/13/18 1630</i>			

Page 5 of 12

T-3.8

Sample Condition Upon Receipt **Client Name:** MN POLLUTION AGENCY **Project #:** _____

Courier: Fed Ex UPS USPS Client

Commercial Pace SpeeDee Other: _____

Tracking Number: _____

WO#: 10427356

PM: SCU **Due Date: 04/27/18**

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer Used: 151401163 G87A9155100842 **Type of Ice:** Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 **Cooler Temp Corrected (°C):** 3.8 **Biological Tissue Frozen?** Yes No N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** 4/13/18

USDA Regulated Soil (N/A, water sample) **Did samples originate in a quarantine zone within the United States:** AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 4/16/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	TS-SB-05 (5-7.5WM)		
Lab Sample ID	10427356001		
Filename	U180423A_05		
Injected By	BAL		
Total Amount Extracted	13.8 g	Matrix	Solid
% Moisture	31.9	Dilution	NA
Dry Weight Extracted	9.40 g	Collected	04/13/2018 10:10
ICAL ID	U180405	Received	04/13/2018 16:35
CCal Filename(s)	U180422B_15 & U180423A_10	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/23/2018 05:32

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	31 R
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	27

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	TS-SB-07 (15-18.5)		
Lab Sample ID	10427356002		
Filename	U180423A_06		
Injected By	BAL		
Total Amount Extracted	12.6 g	Matrix	Solid
% Moisture	7.2	Dilution	NA
Dry Weight Extracted	11.7 g	Collected	04/13/2018 12:20
ICAL ID	U180405	Received	04/13/2018 16:35
CCal Filename(s)	U180422B_15 & U180423A_10	Extracted	04/17/2018 15:45
Method Blank ID	BLANK-61774	Analyzed	04/23/2018 06:20

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	72
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	70

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61774	Matrix	Solid
Filename	Y180422A_04	Dilution	NA
Total Amount Extracted	79.7 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 16:10
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61775	Matrix	Solid
Filename	Y180422A_01	Dilution	NA
Total Amount Extracted	75.1 g	Extracted	04/17/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 13:59
CCal Filename(s)	Y180421B_16 & Y180422A_12	Injected By	BAL
Method Blank ID	BLANK-61774		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.21	104	2,3,7,8-TCDD-13C	2.0	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

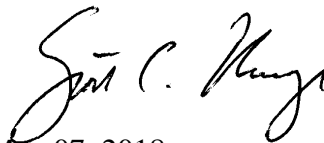
PaceProject#: 10427641
Sample Receipt Date: 04/17/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 07, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

May 7, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 50-58%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 104%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO# 10427641



10427641

Report No.....10427641_8290TCDD_DFR

		Chain-of-Custody Form		Work Order Number:		COC Type:									
PROJECT/CLIENT INFO		Turnaround Time:		COC ID:		FOR LAB USE ONLY									
Facility Code: <i>MPCA-Freeway LF Solids</i>		Program Code (MDH Lab Only):		Lab Name:											
Project Name: <i>MPCA-Freeway LF Solids</i>		Project Task Code:		Address: <i>18-00383</i>											
Project Manager:				Phone No:											
Potential Hazard?		If yes, add information to Sampler Comments Section													
SAMPLE DETAILS				ANALYSIS REQUESTED											
SAMPLE TYPE CODES Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air BL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES Wt=Ground-Groundwater Ws=Surf-Surface Water QC-BLANK=Artificial Blank Water Le=Leachate=Leachate Sample									
Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS PRESERV.	Lab Sample No.	#	
<i>FD-TT-09</i>	<i>S</i>	<i>4/17/18</i>	<i>9:20</i>	<i>4'</i>	<i>12'</i>	<i>C</i>	<i>SD</i>	<i>WM</i>			<i>13</i>		<i>001</i>	<i>1</i>	
<i>FD-TT-10</i>	<i>S</i>	<i>4/17/18</i>	<i>12:15</i>	<i>2'</i>	<i>10'</i>	<i>C</i>	<i>SD</i>	<i>WM</i>			<i>13</i>			<i>2</i>	
<i>FD-TT-11 (M-D)</i>	<i>S</i>	<i>4/17/18</i>	<i>13:24</i>	<i>4'</i>	<i>12'</i>	<i>C</i>	<i>SD</i>	<i>WM</i>			<i>13</i>		<i>002</i>	<i>3</i>	
<i>FD-TT-12 (A)</i>	<i>S</i>	<i>4/17/18</i>	<i>14:37</i>	<i>3'</i>	<i>12'</i>	<i>C</i>	<i>SD</i>	<i>WM</i>			<i>13</i>			<i>4</i>	
<i>FD-TT-13 (B)</i>	<i>S</i>	<i>4/17/18</i>	<i>15:30</i>	<i>3'</i>	<i>12'</i>	<i>C</i>	<i>SD</i>	<i>WM</i>			<i>13</i>		<i>003</i>	<i>5</i>	
														<i>6</i>	
														<i>7</i>	
														<i>8</i>	
														<i>9</i>	
														<i>10</i>	
Sampled By:										Sampler's Signature:		Phone #:			
Receiving Comments:															
Relinquished By/Affiliation:										Date/Time:		Accepted By/ Affiliation:		Date/Time:	
<i>Note returned / Pace</i>										<i>4/17/18 1730</i>		<i>MPCA Pace</i>		<i>4/17/18 1730</i>	

1730
T=9.6

Page 5 of 13

Sample Condition Upon Receipt

Client Name: mn Pollution Control Project #: WO# 10427641

WO# 10427641
 PM: SCU Due Date: 05/02/18
 CLIENT: MONT MINN

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 9.4 Cooler Temp Corrected (°C): 9.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ET 4/17/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2. No "list" included
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. <u>ET 4/17/18</u>
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: Eric Wang Date: 04/18/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-09 (4-12 WM)		
Lab Sample ID	10427641001		
Filename	U180505A_02		
Injected By	BAL		
Total Amount Extracted	13.8 g	Matrix	Solid
% Moisture	22.0	Dilution	NA
Dry Weight Extracted	10.8 g	Collected	04/17/2018 09:20
ICAL ID	U180405	Received	04/17/2018 17:30
CCal Filename(s)	U180504B_15 & U180505A_10	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/05/2018 06:41

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	55

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-11 (4-12 WM)		
Lab Sample ID	10427641002		
Filename	U180505A_03		
Injected By	BAL		
Total Amount Extracted	12.5 g	Matrix	Solid
% Moisture	20.8	Dilution	NA
Dry Weight Extracted	9.90 g	Collected	04/17/2018 13:24
ICAL ID	U180405	Received	04/17/2018 17:30
CCal Filename(s)	U180504B_15 & U180505A_10	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/05/2018 07:28

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	65

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-13 (3-12)		
Lab Sample ID	10427641003		
Filename	U180505A_04		
Injected By	BAL		
Total Amount Extracted	13.7 g	Matrix	Solid
% Moisture	66.6	Dilution	NA
Dry Weight Extracted	4.58 g	Collected	04/17/2018 15:30
ICAL ID	U180405	Received	04/17/2018 17:30
CCal Filename(s)	U180504B_15 & U180505A_10	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/05/2018 08:16

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	3.3	----	1.0	2,3,7,8-TCDD-13C	2.00	50
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	50

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61921	Matrix	Solid
Filename	F180429A_04	Dilution	NA
Total Amount Extracted	10.1 g	Extracted	04/24/2018 14:55
ICAL ID	F180405	Analyzed	04/29/2018 13:19
CCal Filename(s)	F180428A_14 & F180429A_17	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	63
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61922	Matrix	Solid
Filename	F180429A_02	Dilution	NA
Total Amount Extracted	10.0 g	Extracted	04/24/2018 14:55
ICAL ID	F180405	Analyzed	04/29/2018 11:50
CCal Filename(s)	F180428A_14 & F180429A_17	Injected By	BAL
Method Blank ID	BLANK-61921		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.21	104	2,3,7,8-TCDD-13C	2.0	68
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	67

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
R = Recovery outside of target range

Y = RF averaging used in calculations
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 02, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427642001	FD-TT-09 (4-12 WM)	Solid	04/17/18 09:20	04/17/18 17:30
10427642002	FD-TT-10 (2'-10' WM)	Solid	04/17/18 12:15	04/17/18 17:30
10427642003	FD-TT-11 (4-12 WM)	Solid	04/17/18 13:24	04/17/18 17:30
10427642004	FD-TT-12 (3-12)	Solid	04/17/18 14:37	04/17/18 17:30
10427642005	FD-TT-13 (3-12)	Solid	04/17/18 15:30	04/17/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427642001	FD-TT-09 (4-12 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427642002	FD-TT-10 (2'-10' WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427642003	FD-TT-11 (4-12 WM)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427642004	FD-TT-12 (3-12)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10427642005	FD-TT-13 (3-12)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-09 (4-12 WM)** Lab ID: **10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.3	1	04/25/18 10:56	04/30/18 14:13	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	309-00-2	
alpha-BHC	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	319-84-6	
beta-BHC	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	319-85-7	
delta-BHC	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	58-89-9	
Chlordane (Technical)	ND	ug/kg	427	20	04/19/18 13:04	04/27/18 01:07	57-74-9	
alpha-Chlordane	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	5103-71-9	
gamma-Chlordane	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	5103-74-2	
4,4'-DDD	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	72-54-8	
4,4'-DDE	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	72-55-9	
4,4'-DDT	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	50-29-3	
Dieldrin	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	60-57-1	
Endosulfan I	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	959-98-8	
Endosulfan II	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	33213-65-9	
Endosulfan sulfate	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	1031-07-8	
Endrin	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	72-20-8	
Endrin aldehyde	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	7421-93-4	
Endrin ketone	ND	ug/kg	85.2	20	04/19/18 13:04	04/27/18 01:07	53494-70-5	
Heptachlor	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	76-44-8	
Heptachlor epoxide	ND	ug/kg	42.7	20	04/19/18 13:04	04/27/18 01:07	1024-57-3	
Methoxychlor	ND	ug/kg	427	20	04/19/18 13:04	04/27/18 01:07	72-43-5	
Toxaphene	ND	ug/kg	1280	20	04/19/18 13:04	04/27/18 01:07	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/19/18 13:04	04/27/18 01:07	877-09-8	4M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/19/18 13:04	04/27/18 01:07	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11141-16-5	
PCB-1242 (Aroclor 1242)	406	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	12672-29-6	
PCB-1254 (Aroclor 1254)	139	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	11100-14-4	
PCB, Total	545	ug/kg	42.2	1	04/19/18 13:39	04/23/18 17:33	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	80	%	48-125	1	04/19/18 13:39	04/23/18 17:33	877-09-8	
Decachlorobiphenyl (S)	115	%	30-134	1	04/19/18 13:39	04/23/18 17:33	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-09 (4-12 WM) **Lab ID: 10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	65.0	mg/kg	11.0	1	04/19/18 14:54	04/20/18 16:04		T6
Surrogates								
n-Triacontane (S)	91	%.	50-150	1	04/19/18 14:54	04/20/18 16:04	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.1	1	04/27/18 16:39	05/01/18 04:30		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/27/18 16:39	05/01/18 04:30	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10100	mg/kg	12.6	1	04/20/18 05:22	04/23/18 11:28	7429-90-5	
Barium	204	mg/kg	0.63	1	04/20/18 05:22	04/23/18 11:28	7440-39-3	
Boron	75.3	mg/kg	9.4	1	04/20/18 05:22	04/23/18 11:28	7440-42-8	
Copper	75.0	mg/kg	0.63	1	04/20/18 05:22	04/23/18 11:28	7440-50-8	
Iron	33200	mg/kg	15.7	5	04/20/18 05:22	04/23/18 12:38	7439-89-6	
Manganese	328	mg/kg	0.31	1	04/20/18 05:22	04/23/18 11:28	7439-96-5	
Nickel	24.7	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:28	7440-02-0	
Silver	ND	mg/kg	0.63	1	04/20/18 05:22	04/23/18 11:28	7440-22-4	
Tin	48.6	mg/kg	4.7	1	04/20/18 05:22	04/23/18 11:28	7440-31-5	
Titanium	333	mg/kg	1.6	1	04/20/18 05:22	04/23/18 11:28	7440-32-6	
Zinc	214	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:28	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	5.4	mg/kg	0.24	1	04/25/18 09:25	04/26/18 02:47	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.9	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7440-36-0	
Arsenic	12.7	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7440-38-2	
Beryllium	1.0	mg/kg	0.24	20	04/20/18 06:41	04/21/18 04:29	7440-41-7	
Cadmium	2.5	mg/kg	0.097	20	04/20/18 06:41	04/21/18 04:29	7440-43-9	
Cobalt	7.5	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7440-48-4	
Lead	173	mg/kg	0.12	20	04/20/18 06:41	04/21/18 04:29	7439-92-1	
Lithium	6.8	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7439-93-2	
Selenium	2.3	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7782-49-2	
Strontium	56.0	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:29	7440-24-6	
Vanadium	42.0	mg/kg	1.2	20	04/20/18 06:41	04/21/18 04:29	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.24	mg/kg	0.026	1	04/20/18 04:53	04/22/18 16:23	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	22.0	%	0.10	1		04/24/18 13:48		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-09 (4-12 WM) **Lab ID: 10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	208-96-8	
Anthracene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	120-12-7	
Benzo(a)anthracene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	56-55-3	
Benzo(a)pyrene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	101-55-3	
Butylbenzylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	85-68-7	
Carbazole	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	59-50-7	
4-Chloroaniline	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	108-60-1	
2-Chloronaphthalene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	91-58-7	
2-Chlorophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	7005-72-3	
Chrysene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	53-70-3	
Dibenzofuran	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	120-83-2	
Diethylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	105-67-9	
Dimethylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	131-11-3	
Di-n-butylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2180	1	04/19/18 19:31	04/23/18 22:30	534-52-1	M1
2,4-Dinitrophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	51-28-5	M1
2,4-Dinitrotoluene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	606-20-2	
Di-n-octylphthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	117-81-7	
Fluoranthene	565	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	206-44-0	
Fluorene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	87-68-3	
Hexachlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	118-74-1	
Hexachloroethane	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	193-39-5	
Isophorone	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	78-59-1	
1-Methylnaphthalene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	90-12-0	
2-Methylnaphthalene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	91-57-6	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-09 (4-12 WM) **Lab ID: 10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	845	1	04/19/18 19:31	04/23/18 22:30		
Naphthalene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	91-20-3	
2-Nitroaniline	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	88-74-4	
3-Nitroaniline	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	99-09-2	
4-Nitroaniline	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	100-01-6	
Nitrobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	98-95-3	
2-Nitrophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	88-75-5	
4-Nitrophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	86-30-6	
Pentachlorophenol	ND	ug/kg	858	1	04/19/18 19:31	04/23/18 22:30	87-86-5	
Phenanthrene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	85-01-8	
Phenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	108-95-2	
Pyrene	511	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	423	1	04/19/18 19:31	04/23/18 22:30	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	51	%	43-125	1	04/19/18 19:31	04/23/18 22:30	4165-60-0	
2-Fluorobiphenyl (S)	45	%	30-132	1	04/19/18 19:31	04/23/18 22:30	321-60-8	
p-Terphenyl-d14 (S)	66	%	62-125	1	04/19/18 19:31	04/23/18 22:30	1718-51-0	
Phenol-d6 (S)	55	%	48-125	1	04/19/18 19:31	04/23/18 22:30	13127-88-3	
2-Fluorophenol (S)	56	%	40-125	1	04/19/18 19:31	04/23/18 22:30	367-12-4	
2,4,6-Tribromophenol (S)	59	%	60-125	1	04/19/18 19:31	04/23/18 22:30	118-79-6	SO

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	83-32-9	
Acenaphthylene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	208-96-8	
Anthracene	66.4	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	120-12-7	
Benzo(a)anthracene	252	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	56-55-3	
Benzo(a)pyrene	300	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	50-32-8	
Benzo(b)fluoranthene	397	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	205-99-2	
Benzo(g,h,i)perylene	205	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	191-24-2	
Benzo(k)fluoranthene	146	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	207-08-9	
Chrysene	262	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	53-70-3	
Fluoranthene	501	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	206-44-0	
Fluorene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	86-73-7	
Indeno(1,2,3-cd)pyrene	170	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	193-39-5	
Naphthalene	ND	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	91-20-3	
Phenanthrene	231	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	85-01-8	
Pyrene	434	ug/kg	64.0	5	04/19/18 18:12	04/20/18 17:07	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	86	%	42-125	5	04/19/18 18:12	04/20/18 17:07	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-09 (4-12 WM) **Lab ID: 10427642001** Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	92	%	57-125	5	04/19/18 18:12	04/20/18 17:07	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1390	1	04/26/18 10:20	04/26/18 14:02	67-64-1	
Allyl chloride	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	107-05-1	
Benzene	ND	ug/kg	27.8	1	04/26/18 10:20	04/26/18 14:02	71-43-2	
Bromobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	108-86-1	
Bromochloromethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	74-97-5	
Bromodichloromethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	75-27-4	
Bromoform	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	75-25-2	
Bromomethane	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	74-83-9	
2-Butanone (MEK)	ND	ug/kg	347	1	04/26/18 10:20	04/26/18 14:02	78-93-3	
n-Butylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	104-51-8	
sec-Butylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	135-98-8	
tert-Butylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	98-06-6	
Carbon tetrachloride	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	56-23-5	
Chlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	108-90-7	
Chloroethane	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	75-00-3	
Chloroform	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	67-66-3	
Chloromethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	74-87-3	
2-Chlorotoluene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	95-49-8	
4-Chlorotoluene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	96-12-8	
Dibromochloromethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	106-93-4	
Dibromomethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	75-71-8	
1,1-Dichloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	75-34-3	
1,2-Dichloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	107-06-2	
1,1-Dichloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	156-60-5	
Dichlorofluoromethane	ND	ug/kg	695	1	04/26/18 10:20	04/26/18 14:02	75-43-4	
1,2-Dichloropropane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	78-87-5	
1,3-Dichloropropane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	142-28-9	
2,2-Dichloropropane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	594-20-7	
1,1-Dichloropropene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	60-29-7	MO
Ethylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	347	1	04/26/18 10:20	04/26/18 14:02	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-09 (4-12 WM) Lab ID: 10427642001 Collected: 04/17/18 09:20 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	98-82-8	
p-Isopropyltoluene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	99-87-6	
Methylene Chloride	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	347	1	04/26/18 10:20	04/26/18 14:02	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	1634-04-4	
Naphthalene	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	91-20-3	
n-Propylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	103-65-1	
Styrene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	79-34-5	
Tetrachloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	127-18-4	
Tetrahydrofuran	ND	ug/kg	2780	1	04/26/18 10:20	04/26/18 14:02	109-99-9	
Toluene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	79-00-5	
Trichloroethene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	79-01-6	
Trichlorofluoromethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	278	1	04/26/18 10:20	04/26/18 14:02	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	69.5	1	04/26/18 10:20	04/26/18 14:02	108-67-8	
Vinyl chloride	ND	ug/kg	27.8	1	04/26/18 10:20	04/26/18 14:02	75-01-4	
Xylene (Total)	ND	ug/kg	208	1	04/26/18 10:20	04/26/18 14:02	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	04/26/18 10:20	04/26/18 14:02	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	04/26/18 10:20	04/26/18 14:02	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/26/18 10:20	04/26/18 14:02	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	49.3	20	04/23/18 11:09	04/24/18 13:55	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	5.4	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.52	mg/kg	0.50	1	04/25/18 11:00	04/25/18 13:32	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/25/18 14:45	04/26/18 03:47	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) Lab ID: 10427642002 Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.5	1	04/25/18 10:56	04/30/18 14:19	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	309-00-2	
alpha-BHC	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	319-84-6	
beta-BHC	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	319-85-7	
delta-BHC	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	58-89-9	
Chlordane (Technical)	ND	ug/kg	419	20	04/19/18 13:04	04/27/18 00:49	57-74-9	
alpha-Chlordane	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	5103-71-9	
gamma-Chlordane	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	5103-74-2	
4,4'-DDD	185	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	72-54-8	
4,4'-DDE	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	72-55-9	
4,4'-DDT	216	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	50-29-3	
Dieldrin	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	60-57-1	
Endosulfan I	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	959-98-8	
Endosulfan II	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	33213-65-9	
Endosulfan sulfate	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	1031-07-8	
Endrin	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	72-20-8	
Endrin aldehyde	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	7421-93-4	
Endrin ketone	ND	ug/kg	83.5	20	04/19/18 13:04	04/27/18 00:49	53494-70-5	
Heptachlor	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	76-44-8	
Heptachlor epoxide	ND	ug/kg	41.9	20	04/19/18 13:04	04/27/18 00:49	1024-57-3	
Methoxychlor	ND	ug/kg	419	20	04/19/18 13:04	04/27/18 00:49	72-43-5	
Toxaphene	ND	ug/kg	1250	20	04/19/18 13:04	04/27/18 00:49	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	20	04/19/18 13:04	04/27/18 00:49	877-09-8	4M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	20	04/19/18 13:04	04/27/18 00:49	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	11100-14-4	
PCB, Total	ND	ug/kg	41.5	1	04/19/18 13:39	04/23/18 19:56	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	81	%	48-125	1	04/19/18 13:39	04/23/18 19:56	877-09-8	
Decachlorobiphenyl (S)	105	%	30-134	1	04/19/18 13:39	04/23/18 19:56	2051-24-3	CH

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) Lab ID: 10427642002 Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	159	mg/kg	12.4	1	04/19/18 14:54	04/20/18 15:42		T6
Surrogates								
n-Triacontane (S)	106	%	50-150	1	04/19/18 14:54	04/20/18 15:42	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	17.4	1	04/27/18 16:39	05/01/18 04:54		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	04/27/18 16:39	05/01/18 04:54	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8740	mg/kg	12.4	1	04/20/18 05:22	04/23/18 11:37	7429-90-5	
Barium	122	mg/kg	0.62	1	04/20/18 05:22	04/23/18 11:37	7440-39-3	
Boron	74.9	mg/kg	9.3	1	04/20/18 05:22	04/23/18 11:37	7440-42-8	
Copper	36.3	mg/kg	0.62	1	04/20/18 05:22	04/23/18 11:37	7440-50-8	
Iron	22800	mg/kg	15.6	5	04/20/18 05:22	04/23/18 12:47	7439-89-6	
Manganese	293	mg/kg	0.31	1	04/20/18 05:22	04/23/18 11:37	7439-96-5	
Nickel	21.3	mg/kg	1.2	1	04/20/18 05:22	04/23/18 11:37	7440-02-0	
Silver	ND	mg/kg	0.62	1	04/20/18 05:22	04/23/18 11:37	7440-22-4	
Tin	ND	mg/kg	4.7	1	04/20/18 05:22	04/23/18 11:37	7440-31-5	
Titanium	335	mg/kg	1.6	1	04/20/18 05:22	04/23/18 11:37	7440-32-6	
Zinc	235	mg/kg	1.2	1	04/20/18 05:22	04/23/18 11:37	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	7.4	mg/kg	0.23	1	04/25/18 09:25	04/26/18 03:19	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.1	mg/kg	0.61	20	04/20/18 06:41	04/23/18 20:00	7440-36-0	
Arsenic	13.6	mg/kg	0.61	20	04/20/18 06:41	04/23/18 20:00	7440-38-2	
Beryllium	1.7	mg/kg	0.24	20	04/20/18 06:41	04/23/18 20:00	7440-41-7	
Cadmium	1.6	mg/kg	0.098	20	04/20/18 06:41	04/23/18 20:00	7440-43-9	
Cobalt	6.6	mg/kg	0.61	20	04/20/18 06:41	04/23/18 20:00	7440-48-4	
Lead	89.5	mg/kg	0.12	20	04/20/18 06:41	04/23/18 20:00	7439-92-1	
Lithium	8.1	mg/kg	0.61	20	04/20/18 06:41	04/23/18 20:00	7439-93-2	
Selenium	1.7	mg/kg	0.61	20	04/20/18 06:41	04/23/18 20:00	7782-49-2	
Strontium	52.3	mg/kg	0.61	20	04/20/18 06:41	04/23/18 20:00	7440-24-6	
Vanadium	63.3	mg/kg	1.2	20	04/20/18 06:41	04/23/18 20:00	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.18	mg/kg	0.024	1	04/20/18 04:53	04/22/18 16:25	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	20.4	%	0.10	1		04/24/18 13:48		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	208-96-8	
Anthracene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	120-12-7	
Benzo(a)anthracene	1010	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	56-55-3	
Benzo(a)pyrene	974	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	50-32-8	
Benzo(b)fluoranthene	1370	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	205-99-2	
Benzo(g,h,i)perylene	711	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	191-24-2	
Benzo(k)fluoranthene	526	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	101-55-3	
Butylbenzylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	85-68-7	
Carbazole	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	59-50-7	
4-Chloroaniline	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	108-60-1	
2-Chloronaphthalene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	91-58-7	
2-Chlorophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	7005-72-3	
Chrysene	1090	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	53-70-3	
Dibenzofuran	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	120-83-2	
Diethylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	105-67-9	
Dimethylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	131-11-3	
Di-n-butylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2130	1	04/19/18 19:31	04/23/18 23:55	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	606-20-2	
Di-n-octylphthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	117-81-7	
Fluoranthene	2170	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	206-44-0	
Fluorene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	87-68-3	
Hexachlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	118-74-1	
Hexachloroethane	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	67-72-1	
Indeno(1,2,3-cd)pyrene	599	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	193-39-5	
Isophorone	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	78-59-1	
1-Methylnaphthalene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	90-12-0	
2-Methylnaphthalene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	826	1	04/19/18 19:31	04/23/18 23:55		
Naphthalene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	91-20-3	
2-Nitroaniline	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	88-74-4	
3-Nitroaniline	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	99-09-2	
4-Nitroaniline	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	100-01-6	
Nitrobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	98-95-3	
2-Nitrophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	88-75-5	
4-Nitrophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	86-30-6	
Pentachlorophenol	ND	ug/kg	839	1	04/19/18 19:31	04/23/18 23:55	87-86-5	
Phenanthrene	1250	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	85-01-8	
Phenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	108-95-2	
Pyrene	2040	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	413	1	04/19/18 19:31	04/23/18 23:55	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	61	%	43-125	1	04/19/18 19:31	04/23/18 23:55	4165-60-0	
2-Fluorobiphenyl (S)	61	%	30-132	1	04/19/18 19:31	04/23/18 23:55	321-60-8	
p-Terphenyl-d14 (S)	88	%	62-125	1	04/19/18 19:31	04/23/18 23:55	1718-51-0	
Phenol-d6 (S)	67	%	48-125	1	04/19/18 19:31	04/23/18 23:55	13127-88-3	
2-Fluorophenol (S)	64	%	40-125	1	04/19/18 19:31	04/23/18 23:55	367-12-4	
2,4,6-Tribromophenol (S)	78	%	60-125	1	04/19/18 19:31	04/23/18 23:55	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	237	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	83-32-9	
Acenaphthylene	ND	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	208-96-8	
Anthracene	615	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	120-12-7	
Benzo(a)anthracene	1430	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	56-55-3	
Benzo(a)pyrene	1520	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	50-32-8	
Benzo(b)fluoranthene	2080	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	205-99-2	
Benzo(g,h,i)perylene	991	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	191-24-2	
Benzo(k)fluoranthene	702	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	207-08-9	
Chrysene	1610	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	218-01-9	
Dibenz(a,h)anthracene	243	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	53-70-3	
Fluoranthene	3640	ug/kg	126	10	04/19/18 18:12	04/23/18 17:42	206-44-0	
Fluorene	264	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	86-73-7	
Indeno(1,2,3-cd)pyrene	804	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	193-39-5	
Naphthalene	ND	ug/kg	62.8	5	04/19/18 18:12	04/20/18 17:28	91-20-3	
Phenanthrene	2520	ug/kg	126	10	04/19/18 18:12	04/23/18 17:42	85-01-8	
Pyrene	2860	ug/kg	126	10	04/19/18 18:12	04/23/18 17:42	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%	42-125	5	04/19/18 18:12	04/20/18 17:28	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	91	%	57-125	5	04/19/18 18:12	04/20/18 17:28	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1660	1	04/26/18 10:20	04/26/18 16:33	67-64-1	
Allyl chloride	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	107-05-1	
Benzene	37.4	ug/kg	33.2	1	04/26/18 10:20	04/26/18 16:33	71-43-2	
Bromobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	108-86-1	
Bromochloromethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	74-97-5	
Bromodichloromethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	75-27-4	
Bromoform	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	75-25-2	
Bromomethane	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	74-83-9	
2-Butanone (MEK)	ND	ug/kg	416	1	04/26/18 10:20	04/26/18 16:33	78-93-3	
n-Butylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	104-51-8	
sec-Butylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	135-98-8	
tert-Butylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	98-06-6	
Carbon tetrachloride	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	56-23-5	
Chlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	108-90-7	
Chloroethane	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	75-00-3	
Chloroform	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	67-66-3	
Chloromethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	74-87-3	
2-Chlorotoluene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	95-49-8	
4-Chlorotoluene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	96-12-8	
Dibromochloromethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	106-93-4	
Dibromomethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	75-71-8	
1,1-Dichloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	75-34-3	
1,2-Dichloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	107-06-2	
1,1-Dichloroethene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	156-60-5	
Dichlorofluoromethane	ND	ug/kg	831	1	04/26/18 10:20	04/26/18 16:33	75-43-4	
1,2-Dichloropropane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	78-87-5	
1,3-Dichloropropane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	142-28-9	
2,2-Dichloropropane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	594-20-7	
1,1-Dichloropropene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	60-29-7	
Ethylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	416	1	04/26/18 10:20	04/26/18 16:33	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-10 (2'-10' WM) **Lab ID: 10427642002** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	98-82-8	
p-Isopropyltoluene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	99-87-6	
Methylene Chloride	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	416	1	04/26/18 10:20	04/26/18 16:33	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	1634-04-4	
Naphthalene	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	91-20-3	
n-Propylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	103-65-1	
Styrene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	79-34-5	
Tetrachloroethene	422	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	127-18-4	
Tetrahydrofuran	ND	ug/kg	3320	1	04/26/18 10:20	04/26/18 16:33	109-99-9	
Toluene	159	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	79-00-5	
Trichloroethene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	79-01-6	
Trichlorofluoromethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	332	1	04/26/18 10:20	04/26/18 16:33	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	83.1	1	04/26/18 10:20	04/26/18 16:33	108-67-8	
Vinyl chloride	ND	ug/kg	33.2	1	04/26/18 10:20	04/26/18 16:33	75-01-4	
Xylene (Total)	ND	ug/kg	249	1	04/26/18 10:20	04/26/18 16:33	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/26/18 10:20	04/26/18 16:33	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/26/18 10:20	04/26/18 16:33	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125	1	04/26/18 10:20	04/26/18 16:33	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	25.3	10	04/28/18 10:30	04/30/18 14:42	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	7.4	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.45	1	04/25/18 11:00	04/25/18 13:33	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.3	mg/kg	1.0	1	04/25/18 14:45	04/26/18 01:11	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-11 (4-12 WM)** Lab ID: **10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	10.6	1	04/25/18 10:56	04/30/18 14:59	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	309-00-2	
alpha-BHC	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	319-84-6	
beta-BHC	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	319-85-7	
delta-BHC	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	58-89-9	
Chlordane (Technical)	ND	ug/kg	1050	50	04/19/18 13:04	04/27/18 00:12	57-74-9	
alpha-Chlordane	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	5103-71-9	
gamma-Chlordane	130	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	5103-74-2	
4,4'-DDD	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	72-54-8	
4,4'-DDE	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	72-55-9	
4,4'-DDT	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	50-29-3	
Dieldrin	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	60-57-1	
Endosulfan I	ND	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	959-98-8	
Endosulfan II	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	33213-65-9	
Endosulfan sulfate	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	1031-07-8	
Endrin	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	72-20-8	
Endrin aldehyde	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	7421-93-4	
Endrin ketone	ND	ug/kg	210	50	04/19/18 13:04	04/27/18 00:12	53494-70-5	
Heptachlor	145	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	76-44-8	
Heptachlor epoxide	256	ug/kg	105	50	04/19/18 13:04	04/27/18 00:12	1024-57-3	
Methoxychlor	ND	ug/kg	1050	50	04/19/18 13:04	04/27/18 00:12	72-43-5	
Toxaphene	ND	ug/kg	3160	50	04/19/18 13:04	04/27/18 00:12	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	50	04/19/18 13:04	04/27/18 00:12	877-09-8	2M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	50	04/19/18 13:04	04/27/18 00:12	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	11141-16-5	
PCB-1242 (Aroclor 1242)	54600	ug/kg	2080	50	04/19/18 13:39	04/24/18 10:57	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	12672-29-6	
PCB-1254 (Aroclor 1254)	6580	ug/kg	2080	50	04/19/18 13:39	04/24/18 10:57	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	41.6	1	04/19/18 13:39	04/23/18 19:24	11100-14-4	
PCB, Total	61100	ug/kg	2080	50	04/19/18 13:39	04/24/18 10:57	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/19/18 13:39	04/23/18 19:24	877-09-8	
Decachlorobiphenyl (S)	107	%	30-134	1	04/19/18 13:39	04/23/18 19:24	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) **Lab ID: 10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	485	mg/kg	129	10	04/19/18 14:54	04/20/18 15:35		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	10	04/19/18 14:54	04/20/18 15:35	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	15.7	1	04/27/18 16:39	05/01/18 05:19		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%.	80-150	1	04/27/18 16:39	05/01/18 05:19	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9820	mg/kg	11.8	1	04/20/18 05:22	04/23/18 11:39	7429-90-5	
Barium	282	mg/kg	0.59	1	04/20/18 05:22	04/23/18 11:39	7440-39-3	
Boron	65.4	mg/kg	8.9	1	04/20/18 05:22	04/23/18 11:39	7440-42-8	
Copper	43.0	mg/kg	0.59	1	04/20/18 05:22	04/23/18 11:39	7440-50-8	
Iron	27800	mg/kg	14.8	5	04/20/18 05:22	04/23/18 12:49	7439-89-6	
Manganese	238	mg/kg	0.30	1	04/20/18 05:22	04/23/18 11:39	7439-96-5	
Nickel	22.0	mg/kg	1.2	1	04/20/18 05:22	04/23/18 11:39	7440-02-0	
Silver	ND	mg/kg	0.59	1	04/20/18 05:22	04/23/18 11:39	7440-22-4	
Tin	6.3	mg/kg	4.4	1	04/20/18 05:22	04/23/18 11:39	7440-31-5	
Titanium	411	mg/kg	1.5	1	04/20/18 05:22	04/23/18 11:39	7440-32-6	
Zinc	209	mg/kg	1.2	1	04/20/18 05:22	04/23/18 11:39	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	11.7	mg/kg	0.23	1	04/25/18 09:25	04/26/18 03:24	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	4.1	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7440-36-0	
Arsenic	13.6	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7440-38-2	
Beryllium	1.1	mg/kg	0.24	20	04/20/18 06:41	04/21/18 04:48	7440-41-7	
Cadmium	1.9	mg/kg	0.096	20	04/20/18 06:41	04/21/18 04:48	7440-43-9	
Cobalt	7.7	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7440-48-4	
Lead	6520	mg/kg	1.2	200	04/20/18 06:41	04/23/18 20:05	7439-92-1	
Lithium	6.8	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7439-93-2	
Selenium	1.7	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7782-49-2	
Strontium	87.5	mg/kg	0.60	20	04/20/18 06:41	04/21/18 04:48	7440-24-6	
Vanadium	49.0	mg/kg	1.2	20	04/20/18 06:41	04/21/18 04:48	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.13	mg/kg	0.022	1	04/20/18 04:53	04/22/18 16:27	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	20.8	%	0.10	1		04/24/18 13:48		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	780	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) Lab ID: 10427642003 Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	208-96-8	
Anthracene	1990	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	120-12-7	
Benzo(a)anthracene	4470	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	56-55-3	
Benzo(a)pyrene	3890	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	50-32-8	
Benzo(b)fluoranthene	4850	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	205-99-2	
Benzo(g,h,i)perylene	2680	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	191-24-2	
Benzo(k)fluoranthene	2190	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	101-55-3	
Butylbenzylphthalate	423	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	85-68-7	
Carbazole	984	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	59-50-7	
4-Chloroaniline	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	108-60-1	
2-Chloronaphthalene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	91-58-7	
2-Chlorophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	7005-72-3	
Chrysene	4660	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	53-70-3	
Dibenzofuran	482	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	120-83-2	
Diethylphthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	105-67-9	
Dimethylphthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	131-11-3	
Di-n-butylphthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2140	1	04/19/18 19:31	04/25/18 23:03	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	606-20-2	
Di-n-octylphthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	117-81-7	
Fluoranthene	9750	ug/kg	832	2	04/19/18 19:31	04/26/18 15:42	206-44-0	
Fluorene	887	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	87-68-3	
Hexachlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	118-74-1	
Hexachloroethane	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	67-72-1	
Indeno(1,2,3-cd)pyrene	2290	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	193-39-5	
Isophorone	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	78-59-1	
1-Methylnaphthalene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	90-12-0	
2-Methylnaphthalene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: **FD-TT-11 (4-12 WM)** Lab ID: **10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	832	1	04/19/18 19:31	04/25/18 23:03		
Naphthalene	792	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	91-20-3	
2-Nitroaniline	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	88-74-4	
3-Nitroaniline	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	99-09-2	
4-Nitroaniline	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	100-01-6	
Nitrobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	98-95-3	
2-Nitrophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	88-75-5	
4-Nitrophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	86-30-6	
Pentachlorophenol	ND	ug/kg	844	1	04/19/18 19:31	04/25/18 23:03	87-86-5	
Phenanthrene	6610	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	85-01-8	
Phenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	108-95-2	
Pyrene	9500	ug/kg	832	2	04/19/18 19:31	04/26/18 15:42	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	416	1	04/19/18 19:31	04/25/18 23:03	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	53	%	43-125	1	04/19/18 19:31	04/25/18 23:03	4165-60-0	
2-Fluorobiphenyl (S)	55	%	30-132	1	04/19/18 19:31	04/25/18 23:03	321-60-8	
p-Terphenyl-d14 (S)	74	%	62-125	1	04/19/18 19:31	04/25/18 23:03	1718-51-0	
Phenol-d6 (S)	59	%	48-125	1	04/19/18 19:31	04/25/18 23:03	13127-88-3	
2-Fluorophenol (S)	53	%	40-125	1	04/19/18 19:31	04/25/18 23:03	367-12-4	
2,4,6-Tribromophenol (S)	68	%	60-125	1	04/19/18 19:31	04/25/18 23:03	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	163	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	83-32-9	
Acenaphthylene	444	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	208-96-8	
Anthracene	954	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	120-12-7	
Benzo(a)anthracene	3260	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	56-55-3	
Benzo(a)pyrene	3110	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	50-32-8	
Benzo(b)fluoranthene	3520	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	205-99-2	
Benzo(g,h,i)perylene	1650	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	191-24-2	
Benzo(k)fluoranthene	1140	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	207-08-9	
Chrysene	2790	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	218-01-9	
Dibenz(a,h)anthracene	457	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	53-70-3	
Fluoranthene	5790	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	206-44-0	
Fluorene	237	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	86-73-7	
Indeno(1,2,3-cd)pyrene	1370	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	193-39-5	
Naphthalene	416	ug/kg	63.0	5	04/19/18 18:12	04/20/18 17:49	91-20-3	
Phenanthrene	2730	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	85-01-8	
Pyrene	6120	ug/kg	315	25	04/19/18 18:12	04/23/18 19:06	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%	42-125	5	04/19/18 18:12	04/20/18 17:49	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) **Lab ID: 10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	89	%	57-125	5	04/19/18 18:12	04/20/18 17:49	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1450	1	04/26/18 10:20	04/26/18 16:50	67-64-1	
Allyl chloride	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	107-05-1	
Benzene	ND	ug/kg	29.0	1	04/26/18 10:20	04/26/18 16:50	71-43-2	
Bromobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	108-86-1	
Bromochloromethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	74-97-5	
Bromodichloromethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	75-27-4	
Bromoform	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	75-25-2	
Bromomethane	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	74-83-9	
2-Butanone (MEK)	ND	ug/kg	363	1	04/26/18 10:20	04/26/18 16:50	78-93-3	
n-Butylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	104-51-8	
sec-Butylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	135-98-8	
tert-Butylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	98-06-6	
Carbon tetrachloride	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	56-23-5	
Chlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	108-90-7	
Chloroethane	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	75-00-3	
Chloroform	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	67-66-3	
Chloromethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	74-87-3	
2-Chlorotoluene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	95-49-8	
4-Chlorotoluene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	96-12-8	
Dibromochloromethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	106-93-4	
Dibromomethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	75-71-8	
1,1-Dichloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	75-34-3	
1,2-Dichloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	107-06-2	
1,1-Dichloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	156-60-5	
Dichlorofluoromethane	ND	ug/kg	726	1	04/26/18 10:20	04/26/18 16:50	75-43-4	
1,2-Dichloropropane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	78-87-5	
1,3-Dichloropropane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	142-28-9	
2,2-Dichloropropane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	594-20-7	
1,1-Dichloropropene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	60-29-7	
Ethylbenzene	73.6	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	363	1	04/26/18 10:20	04/26/18 16:50	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-11 (4-12 WM) **Lab ID: 10427642003** Collected: 04/17/18 13:24 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	98-82-8	
p-Isopropyltoluene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	99-87-6	
Methylene Chloride	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	363	1	04/26/18 10:20	04/26/18 16:50	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	1634-04-4	
Naphthalene	558	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	91-20-3	
n-Propylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	103-65-1	
Styrene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	79-34-5	
Tetrachloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	127-18-4	
Tetrahydrofuran	ND	ug/kg	2900	1	04/26/18 10:20	04/26/18 16:50	109-99-9	
Toluene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	79-00-5	
Trichloroethene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	79-01-6	
Trichlorofluoromethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	290	1	04/26/18 10:20	04/26/18 16:50	76-13-1	
1,2,4-Trimethylbenzene	73.5	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	72.6	1	04/26/18 10:20	04/26/18 16:50	108-67-8	
Vinyl chloride	ND	ug/kg	29.0	1	04/26/18 10:20	04/26/18 16:50	75-01-4	
Xylene (Total)	ND	ug/kg	218	1	04/26/18 10:20	04/26/18 16:50	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	92	%	75-125	1	04/26/18 10:20	04/26/18 16:50	17060-07-0	
Toluene-d8 (S)	96	%	75-125	1	04/26/18 10:20	04/26/18 16:50	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125	1	04/26/18 10:20	04/26/18 16:50	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	49.5	20	04/28/18 10:30	04/30/18 14:42	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	11.7	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.48	1	04/25/18 11:00	04/25/18 13:37	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.98	1	04/25/18 14:45	04/25/18 23:53	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)

Methyl Mercury	ND	ng/g	14.1	1	04/25/18 10:56	04/30/18 15:06	7439-97-6	N3
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8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550

Aldrin	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	309-00-2	
alpha-BHC	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	319-84-6	
beta-BHC	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	319-85-7	
delta-BHC	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	58-89-9	
Chlordane (Technical)	ND	ug/kg	116	5	04/19/18 13:04	04/26/18 23:17	57-74-9	
alpha-Chlordane	19.0	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	5103-71-9	
gamma-Chlordane	15.1	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	5103-74-2	
4,4'-DDD	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	72-54-8	
4,4'-DDE	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	72-55-9	
4,4'-DDT	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	50-29-3	
Dieldrin	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	60-57-1	
Endosulfan I	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	959-98-8	
Endosulfan II	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	33213-65-9	
Endosulfan sulfate	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	1031-07-8	
Endrin	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	72-20-8	
Endrin aldehyde	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	7421-93-4	
Endrin ketone	ND	ug/kg	23.0	5	04/19/18 13:04	04/26/18 23:17	53494-70-5	
Heptachlor	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	76-44-8	
Heptachlor epoxide	ND	ug/kg	11.6	5	04/19/18 13:04	04/26/18 23:17	1024-57-3	
Methoxychlor	ND	ug/kg	116	5	04/19/18 13:04	04/26/18 23:17	72-43-5	
Toxaphene	ND	ug/kg	346	5	04/19/18 13:04	04/26/18 23:17	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	84	%	30-150	5	04/19/18 13:04	04/26/18 23:17	877-09-8	5M,D4
Decachlorobiphenyl (S)	91	%	30-150	5	04/19/18 13:04	04/26/18 23:17	2051-24-3	

8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550

PCB-1016 (Aroclor 1016)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11141-16-5	
PCB-1242 (Aroclor 1242)	604	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	12672-29-6	
PCB-1254 (Aroclor 1254)	155	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	11100-14-4	
PCB, Total	759	ug/kg	45.6	1	04/19/18 13:39	04/23/18 18:21	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	48-125	1	04/19/18 13:39	04/23/18 18:21	877-09-8	
Decachlorobiphenyl (S)	107	%	30-134	1	04/19/18 13:39	04/23/18 18:21	2051-24-3	CH

WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO

WIDRO C10-C28	222	mg/kg	13.2	1	04/19/18 14:54	04/20/18 15:49		T6
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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	73	%	50-150	1	04/19/18 14:54	04/20/18 15:49	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	37.5	mg/kg	15.8	1	04/27/18 16:39	05/01/18 05:43		
Surrogates								
a,a,a-Trifluorotoluene (S)	97	%	80-150	1	04/27/18 16:39	05/01/18 05:43	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	10900	mg/kg	13.2	1	04/20/18 05:22	04/23/18 11:42	7429-90-5	
Barium	109	mg/kg	0.66	1	04/20/18 05:22	04/23/18 11:42	7440-39-3	
Boron	198	mg/kg	9.9	1	04/20/18 05:22	04/23/18 11:42	7440-42-8	
Copper	31.6	mg/kg	0.66	1	04/20/18 05:22	04/23/18 11:42	7440-50-8	
Iron	38800	mg/kg	16.5	5	04/20/18 05:22	04/23/18 12:52	7439-89-6	
Manganese	145	mg/kg	0.33	1	04/20/18 05:22	04/23/18 11:42	7439-96-5	
Nickel	27.4	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:42	7440-02-0	
Silver	ND	mg/kg	0.66	1	04/20/18 05:22	04/23/18 11:42	7440-22-4	
Tin	ND	mg/kg	5.0	1	04/20/18 05:22	04/23/18 11:42	7440-31-5	
Titanium	478	mg/kg	1.7	1	04/20/18 05:22	04/23/18 11:42	7440-32-6	
Zinc	171	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:42	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	11.4	mg/kg	0.26	1	04/25/18 09:25	04/26/18 03:28	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.2	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7440-36-0	
Arsenic	17.3	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7440-38-2	
Beryllium	2.9	mg/kg	0.27	20	04/20/18 06:41	04/23/18 20:09	7440-41-7	
Cadmium	1.9	mg/kg	0.11	20	04/20/18 06:41	04/23/18 20:09	7440-43-9	
Cobalt	7.2	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7440-48-4	
Lead	28.5	mg/kg	0.13	20	04/20/18 06:41	04/23/18 20:09	7439-92-1	
Lithium	10.8	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7439-93-2	
Selenium	5.4	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7782-49-2	
Strontium	66.6	mg/kg	0.67	20	04/20/18 06:41	04/23/18 20:09	7440-24-6	
Vanadium	81.3	mg/kg	1.3	20	04/20/18 06:41	04/23/18 20:09	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.14	mg/kg	0.026	1	04/20/18 04:53	04/22/18 16:29	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	27.9	%	0.10	1		04/24/18 13:49		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	83-32-9	
Acenaphthylene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	120-12-7	
Benzo(a)anthracene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	56-55-3	
Benzo(a)pyrene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	101-55-3	
Butylbenzylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	85-68-7	
Carbazole	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	59-50-7	
4-Chloroaniline	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	108-60-1	
2-Chloronaphthalene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	91-58-7	
2-Chlorophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	7005-72-3	
Chrysene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	53-70-3	
Dibenzofuran	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	120-83-2	
Diethylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	105-67-9	
Dimethylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	131-11-3	
Di-n-butylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2350	1	04/19/18 19:31	04/25/18 19:42	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	606-20-2	
Di-n-octylphthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	117-81-7	
Fluoranthene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	206-44-0	
Fluorene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	87-68-3	
Hexachlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	118-74-1	
Hexachloroethane	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	193-39-5	
Isophorone	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	78-59-1	
1-Methylnaphthalene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	90-12-0	
2-Methylnaphthalene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	914	1	04/19/18 19:31	04/25/18 19:42		
Naphthalene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	91-20-3	
2-Nitroaniline	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	88-74-4	
3-Nitroaniline	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	99-09-2	
4-Nitroaniline	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	100-01-6	
Nitrobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	98-95-3	
2-Nitrophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	88-75-5	
4-Nitrophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	86-30-6	
Pentachlorophenol	ND	ug/kg	928	1	04/19/18 19:31	04/25/18 19:42	87-86-5	
Phenanthrene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	85-01-8	
Phenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	108-95-2	
Pyrene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	457	1	04/19/18 19:31	04/25/18 19:42	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	42	%.	43-125	1	04/19/18 19:31	04/25/18 19:42	4165-60-0	S0
2-Fluorobiphenyl (S)	49	%.	30-132	1	04/19/18 19:31	04/25/18 19:42	321-60-8	
p-Terphenyl-d14 (S)	64	%.	62-125	1	04/19/18 19:31	04/25/18 19:42	1718-51-0	
Phenol-d6 (S)	48	%.	48-125	1	04/19/18 19:31	04/25/18 19:42	13127-88-3	
2-Fluorophenol (S)	45	%.	40-125	1	04/19/18 19:31	04/25/18 19:42	367-12-4	
2,4,6-Tribromophenol (S)	63	%.	60-125	1	04/19/18 19:31	04/25/18 19:42	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	49.1	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	83-32-9	M1
Acenaphthylene	ND	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	208-96-8	
Anthracene	94.1	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	120-12-7	M1,R1
Benzo(a)anthracene	660	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	56-55-3	M1
Benzo(a)pyrene	680	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	50-32-8	M1,R1
Benzo(b)fluoranthene	879	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	205-99-2	M1,R1
Benzo(g,h,i)perylene	358	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	191-24-2	M1
Benzo(k)fluoranthene	293	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	207-08-9	M1
Chrysene	570	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	218-01-9	M1
Dibenz(a,h)anthracene	88.8	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	53-70-3	M1
Fluoranthene	1040	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	206-44-0	M1,R1
Fluorene	43.3	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	86-73-7	M1
Indeno(1,2,3-cd)pyrene	308	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	193-39-5	M1
Naphthalene	106	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	91-20-3	M1
Phenanthrene	318	ug/kg	13.9	1	04/19/18 18:12	04/20/18 15:44	85-01-8	M1
Pyrene	872	ug/kg	69.3	5	04/19/18 18:12	04/23/18 18:45	129-00-0	M1,R1
Surrogates								
2-Fluorobiphenyl (S)	86	%.	42-125	1	04/19/18 18:12	04/20/18 15:44	321-60-8	
p-Terphenyl-d14 (S)	92	%.	57-125	1	04/19/18 18:12	04/20/18 15:44	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1480	1	04/26/18 10:20	04/26/18 17:07	67-64-1	
Allyl chloride	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	107-05-1	
Benzene	73.8	ug/kg	29.6	1	04/26/18 10:20	04/26/18 17:07	71-43-2	
Bromobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	108-86-1	
Bromochloromethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	74-97-5	
Bromodichloromethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	75-27-4	
Bromoform	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	75-25-2	
Bromomethane	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	74-83-9	
2-Butanone (MEK)	ND	ug/kg	370	1	04/26/18 10:20	04/26/18 17:07	78-93-3	
n-Butylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	104-51-8	
sec-Butylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	135-98-8	
tert-Butylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	98-06-6	
Carbon tetrachloride	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	56-23-5	
Chlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	108-90-7	
Chloroethane	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	75-00-3	
Chloroform	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	67-66-3	
Chloromethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	74-87-3	
2-Chlorotoluene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	95-49-8	
4-Chlorotoluene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	96-12-8	
Dibromochloromethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	106-93-4	
Dibromomethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	75-71-8	
1,1-Dichloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	75-34-3	
1,2-Dichloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	107-06-2	
1,1-Dichloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	156-60-5	
Dichlorofluoromethane	ND	ug/kg	740	1	04/26/18 10:20	04/26/18 17:07	75-43-4	
1,2-Dichloropropane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	78-87-5	
1,3-Dichloropropane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	142-28-9	
2,2-Dichloropropane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	594-20-7	
1,1-Dichloropropene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	60-29-7	
Ethylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	370	1	04/26/18 10:20	04/26/18 17:07	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	98-82-8	
p-Isopropyltoluene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	99-87-6	
Methylene Chloride	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	370	1	04/26/18 10:20	04/26/18 17:07	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-12 (3-12) **Lab ID: 10427642004** Collected: 04/17/18 14:37 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	1634-04-4	
Naphthalene	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	91-20-3	
n-Propylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	103-65-1	
Styrene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	79-34-5	
Tetrachloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	127-18-4	
Tetrahydrofuran	ND	ug/kg	2960	1	04/26/18 10:20	04/26/18 17:07	109-99-9	
Toluene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	79-00-5	
Trichloroethene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	79-01-6	
Trichlorofluoromethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	296	1	04/26/18 10:20	04/26/18 17:07	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	74.0	1	04/26/18 10:20	04/26/18 17:07	108-67-8	
Vinyl chloride	ND	ug/kg	29.6	1	04/26/18 10:20	04/26/18 17:07	75-01-4	
Xylene (Total)	ND	ug/kg	222	1	04/26/18 10:20	04/26/18 17:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%.	75-125	1	04/26/18 10:20	04/26/18 17:07	17060-07-0	
Toluene-d8 (S)	96	%.	75-125	1	04/26/18 10:20	04/26/18 17:07	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	75-125	1	04/26/18 10:20	04/26/18 17:07	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	27.4	10	04/28/18 10:30	04/30/18 14:43	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	11.4	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.51	1	04/25/18 11:00	04/25/18 13:37	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	1.9	mg/kg	0.99	1	04/25/18 14:45	04/26/18 01:31	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	30.3	1	04/25/18 10:56	04/30/18 15:13	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	309-00-2	
alpha-BHC	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	319-84-6	
beta-BHC	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	319-85-7	
delta-BHC	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	58-89-9	
Chlordane (Technical)	ND	ug/kg	500	10	04/19/18 13:04	04/26/18 22:59	57-74-9	
alpha-Chlordane	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	5103-71-9	
gamma-Chlordane	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	5103-74-2	
4,4'-DDD	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	72-54-8	
4,4'-DDE	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	72-55-9	
4,4'-DDT	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	50-29-3	
Dieldrin	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	60-57-1	
Endosulfan I	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	959-98-8	
Endosulfan II	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	33213-65-9	
Endosulfan sulfate	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	1031-07-8	
Endrin	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	72-20-8	
Endrin aldehyde	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	7421-93-4	
Endrin ketone	ND	ug/kg	99.7	10	04/19/18 13:04	04/26/18 22:59	53494-70-5	
Heptachlor	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	76-44-8	
Heptachlor epoxide	ND	ug/kg	50.0	10	04/19/18 13:04	04/26/18 22:59	1024-57-3	
Methoxychlor	ND	ug/kg	500	10	04/19/18 13:04	04/26/18 22:59	72-43-5	
Toxaphene	ND	ug/kg	1500	10	04/19/18 13:04	04/26/18 22:59	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	04/19/18 13:04	04/26/18 22:59	877-09-8	6M, D3, S4
Decachlorobiphenyl (S)	0	%	30-150	10	04/19/18 13:04	04/26/18 22:59	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	11141-16-5	
PCB-1242 (Aroclor 1242)	33000	ug/kg	985	10	04/19/18 13:39	04/24/18 10:10	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	12672-29-6	
PCB-1254 (Aroclor 1254)	11200	ug/kg	985	10	04/19/18 13:39	04/24/18 10:10	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	98.5	1	04/19/18 13:39	04/23/18 18:37	11100-14-4	
PCB, Total	44200	ug/kg	985	10	04/19/18 13:39	04/24/18 10:10	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	99	%	48-125	1	04/19/18 13:39	04/23/18 18:37	877-09-8	
Decachlorobiphenyl (S)	95	%	30-134	1	04/19/18 13:39	04/23/18 18:37	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3790	mg/kg	609	20	04/19/18 14:54	04/21/18 09:58		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/19/18 14:54	04/21/18 09:58	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	854	mg/kg	34.4	1	04/27/18 16:39	05/01/18 06:07		
Surrogates								
a,a,a-Trifluorotoluene (S)	96	%.	80-150	1	04/27/18 16:39	05/01/18 06:07	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7360	mg/kg	28.0	1	04/20/18 05:22	04/23/18 11:45	7429-90-5	
Barium	289	mg/kg	1.4	1	04/20/18 05:22	04/23/18 11:45	7440-39-3	
Boron	167	mg/kg	21.0	1	04/20/18 05:22	04/23/18 11:45	7440-42-8	
Copper	96.5	mg/kg	1.4	1	04/20/18 05:22	04/23/18 11:45	7440-50-8	
Iron	72600	mg/kg	35.0	5	04/20/18 05:22	04/23/18 12:55	7439-89-6	
Manganese	806	mg/kg	0.70	1	04/20/18 05:22	04/23/18 11:45	7439-96-5	
Nickel	23.8	mg/kg	2.8	1	04/20/18 05:22	04/23/18 11:45	7440-02-0	
Silver	ND	mg/kg	1.4	1	04/20/18 05:22	04/23/18 11:45	7440-22-4	
Tin	33.1	mg/kg	10.5	1	04/20/18 05:22	04/23/18 11:45	7440-31-5	
Titanium	193	mg/kg	3.5	1	04/20/18 05:22	04/23/18 11:45	7440-32-6	
Zinc	553	mg/kg	2.8	1	04/20/18 05:22	04/23/18 11:45	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	12.6	mg/kg	0.57	1	04/25/18 09:25	04/26/18 03:33	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	5.0	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7440-36-0	
Arsenic	5.8	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7440-38-2	
Beryllium	ND	mg/kg	0.57	20	04/20/18 06:41	04/23/18 20:14	7440-41-7	
Cadmium	2.4	mg/kg	0.23	20	04/20/18 06:41	04/23/18 20:14	7440-43-9	
Cobalt	3.5	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7440-48-4	
Lead	94.3	mg/kg	0.29	20	04/20/18 06:41	04/23/18 20:14	7439-92-1	
Lithium	2.1	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7439-93-2	
Selenium	ND	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7782-49-2	
Strontium	41.3	mg/kg	1.4	20	04/20/18 06:41	04/23/18 20:14	7440-24-6	
Vanadium	22.1	mg/kg	2.9	20	04/20/18 06:41	04/23/18 20:14	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.75	mg/kg	0.053	1	04/20/18 04:53	04/22/18 16:31	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	66.6	%	0.10	1		04/24/18 13:49		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	208-96-8	
Anthracene	3520	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	120-12-7	
Benzo(a)anthracene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	56-55-3	
Benzo(a)pyrene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	101-55-3	
Butylbenzylphthalate	1490	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	85-68-7	
Carbazole	1430	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	59-50-7	
4-Chloroaniline	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	108-60-1	
2-Chloronaphthalene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	91-58-7	
2-Chlorophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	7005-72-3	
Chrysene	993	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	53-70-3	
Dibenzofuran	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	120-83-2	
Diethylphthalate	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	105-67-9	
Dimethylphthalate	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	131-11-3	
Di-n-butylphthalate	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	5080	1	04/19/18 19:31	04/26/18 15:08	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	606-20-2	
Di-n-octylphthalate	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	122-66-7	
bis(2-Ethylhexyl)phthalate	125000	ug/kg	9850	10	04/19/18 19:31	04/26/18 16:40	117-81-7	
Fluoranthene	2730	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	206-44-0	
Fluorene	1390	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	87-68-3	
Hexachlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	118-74-1	
Hexachloroethane	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	193-39-5	
Isophorone	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	78-59-1	
1-Methylnaphthalene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	90-12-0	
2-Methylnaphthalene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	91-57-6	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID:** 10427642005 Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1970	1	04/19/18 19:31	04/26/18 15:08		
Naphthalene	1650	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	91-20-3	
2-Nitroaniline	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	88-74-4	
3-Nitroaniline	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	99-09-2	
4-Nitroaniline	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	100-01-6	
Nitrobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	88-95-3	
2-Nitrophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	88-75-5	
4-Nitrophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	86-30-6	
Pentachlorophenol	ND	ug/kg	2000	1	04/19/18 19:31	04/26/18 15:08	87-86-5	
Phenanthrene	4060	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	85-01-8	
Phenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	108-95-2	
Pyrene	1890	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	985	1	04/19/18 19:31	04/26/18 15:08	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	43	%	43-125	1	04/19/18 19:31	04/26/18 15:08	4165-60-0	
2-Fluorobiphenyl (S)	48	%	30-132	1	04/19/18 19:31	04/26/18 15:08	321-60-8	
p-Terphenyl-d14 (S)	60	%	62-125	1	04/19/18 19:31	04/26/18 15:08	1718-51-0	S5
Phenol-d6 (S)	50	%	48-125	1	04/19/18 19:31	04/26/18 15:08	13127-88-3	
2-Fluorophenol (S)	45	%	40-125	1	04/19/18 19:31	04/26/18 15:08	367-12-4	
2,4,6-Tribromophenol (S)	55	%	60-125	1	04/19/18 19:31	04/26/18 15:08	118-79-6	S5

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	887	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	83-32-9	
Acenaphthylene	ND	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	208-96-8	
Anthracene	5550	ug/kg	299	10	04/19/18 18:12	04/23/18 18:03	120-12-7	
Benzo(a)anthracene	643	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	56-55-3	
Benzo(a)pyrene	317	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	50-32-8	
Benzo(b)fluoranthene	507	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	205-99-2	
Benzo(g,h,i)perylene	150	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	191-24-2	
Benzo(k)fluoranthene	207	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	207-08-9	
Chrysene	1130	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	53-70-3	
Fluoranthene	2760	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	206-44-0	
Fluorene	1560	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	193-39-5	
Naphthalene	2480	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	91-20-3	
Phenanthrene	4450	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	85-01-8	
Pyrene	1860	ug/kg	149	5	04/19/18 18:12	04/20/18 18:09	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%	42-125	5	04/19/18 18:12	04/20/18 18:09	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	93	%	57-125	5	04/19/18 18:12	04/20/18 18:09	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	3030	1	04/26/18 10:20	04/26/18 14:19	67-64-1	
Allyl chloride	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	107-05-1	
Benzene	ND	ug/kg	60.6	1	04/26/18 10:20	04/26/18 14:19	71-43-2	
Bromobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	108-86-1	
Bromochloromethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	74-97-5	
Bromodichloromethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	75-27-4	
Bromoform	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	75-25-2	
Bromomethane	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	74-83-9	
2-Butanone (MEK)	ND	ug/kg	758	1	04/26/18 10:20	04/26/18 14:19	78-93-3	
n-Butylbenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	104-51-8	
sec-Butylbenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	135-98-8	
tert-Butylbenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	98-06-6	
Carbon tetrachloride	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	56-23-5	
Chlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	108-90-7	
Chloroethane	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	75-00-3	
Chloroform	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	67-66-3	
Chloromethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	74-87-3	
2-Chlorotoluene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	95-49-8	
4-Chlorotoluene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	96-12-8	
Dibromochloromethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	106-93-4	
Dibromomethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	75-71-8	
1,1-Dichloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	75-34-3	
1,2-Dichloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	107-06-2	
1,1-Dichloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1520	1	04/26/18 10:20	04/26/18 14:19	75-43-4	
1,2-Dichloropropane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	78-87-5	
1,3-Dichloropropane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	142-28-9	
2,2-Dichloropropane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	594-20-7	
1,1-Dichloropropene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	60-29-7	
Ethylbenzene	435	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	100-41-4	D6
Hexachloro-1,3-butadiene	ND	ug/kg	758	1	04/26/18 10:20	04/26/18 14:19	87-68-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Sample: FD-TT-13 (3-12) **Lab ID: 10427642005** Collected: 04/17/18 15:30 Received: 04/17/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	98-82-8	
p-Isopropyltoluene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	99-87-6	
Methylene Chloride	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	758	1	04/26/18 10:20	04/26/18 14:19	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	1634-04-4	
Naphthalene	972	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	91-20-3	D6
n-Propylbenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	103-65-1	
Styrene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	79-34-5	
Tetrachloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	127-18-4	
Tetrahydrofuran	ND	ug/kg	6060	1	04/26/18 10:20	04/26/18 14:19	109-99-9	
Toluene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	79-00-5	
Trichloroethene	ND	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	79-01-6	
Trichlorofluoromethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	606	1	04/26/18 10:20	04/26/18 14:19	76-13-1	
1,2,4-Trimethylbenzene	538	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	95-63-6	D6
1,3,5-Trimethylbenzene	156	ug/kg	152	1	04/26/18 10:20	04/26/18 14:19	108-67-8	D6
Vinyl chloride	ND	ug/kg	60.6	1	04/26/18 10:20	04/26/18 14:19	75-01-4	
Xylene (Total)	1350	ug/kg	455	1	04/26/18 10:20	04/26/18 14:19	1330-20-7	D6
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/26/18 10:20	04/26/18 14:19	17060-07-0	1M
Toluene-d8 (S)	96	%	75-125	1	04/26/18 10:20	04/26/18 14:19	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125	1	04/26/18 10:20	04/26/18 14:19	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	60.6	10	04/28/18 10:30	04/30/18 14:43	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	12.6	mg/kg	1.0	1		05/02/18 08:16	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	2.4	mg/kg	1.7	1	04/25/18 11:00	04/25/18 13:40	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/25/18 14:45	04/26/18 00:52	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

QC Batch: 141683 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 560161 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/30/18 13:39	N3

METHOD BLANK: 560162 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	2.98	04/30/18 13:46	N3

METHOD BLANK: 560163 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.04	04/30/18 13:53	N3

LABORATORY CONTROL SAMPLE: 560164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	119	115	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 560165 560166

Parameter	Units	10427354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	357	357	354	388	99	108	65-135	9	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 534800

Analysis Method: WI MOD GRO

QC Batch Method: EPA 5030 Medium Soil

Analysis Description: WIGRO Solid GCV

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2905429

Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/30/18 21:12	
a,a,a-Trifluorotoluene (S)	%.	98	80-150	04/30/18 21:12	

LABORATORY CONTROL SAMPLE & LCSD: 2905430

2905431

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	42.8	41.3	86	83	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%.				98	97	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2905441

2905442

Parameter	Units	10428528007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	ND	57.9	56.1	49.4	46.5	85	83	80-120	6	20	
a,a,a-Trifluorotoluene (S)	%.						99	99	80-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533419 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897699 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/22/18 15:58	

LABORATORY CONTROL SAMPLE: 2897700

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.53	110	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897701 2897702

Parameter	Units	10426879001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	<0.018	.47	.5	0.48	0.46	103	93	80-120	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533415 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897683 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	10.0	04/23/18 10:48	
Barium	mg/kg	ND	0.50	04/23/18 10:48	
Boron	mg/kg	ND	7.5	04/23/18 10:48	
Copper	mg/kg	ND	0.50	04/23/18 10:48	
Iron	mg/kg	ND	2.5	04/23/18 10:48	
Manganese	mg/kg	ND	0.25	04/23/18 10:48	
Nickel	mg/kg	ND	1.0	04/23/18 10:48	
Silver	mg/kg	ND	0.50	04/23/18 10:48	
Tin	mg/kg	ND	3.8	04/23/18 10:48	
Titanium	mg/kg	ND	1.2	04/23/18 10:48	
Zinc	mg/kg	ND	1.0	04/23/18 10:48	

LABORATORY CONTROL SAMPLE: 2897684

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	1000	997	100	80-120	
Barium	mg/kg	50	51.0	102	80-120	
Boron	mg/kg	50	46.7	93	80-120	
Copper	mg/kg	50	49.1	98	80-120	
Iron	mg/kg	1000	1010	101	80-120	
Manganese	mg/kg	50	50.9	102	80-120	
Nickel	mg/kg	50	49.8	100	80-120	
Silver	mg/kg	25	23.5	94	80-120	
Tin	mg/kg	50	49.4	99	80-120	
Titanium	mg/kg	50	49.8	100	80-120	
Zinc	mg/kg	50	48.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897685 2897686

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427793001 Result	Spike Conc.	Spike Conc.	Result						
Aluminum	mg/kg	34800	990	952	35400	35400	64	61	75-125	0	20 P6
Barium	mg/kg	1320	49.5	47.6	1320	1320	-1	0	75-125	0	20 P6
Boron	mg/kg	43.3	49.5	47.6	87.4	85.7	89	89	75-125	2	20
Copper	mg/kg	2140	49.5	47.6	2090	2100	-85	-66	75-125	1	20 P6
Iron	mg/kg	31500	990	952	31000	31000	-51	-51	75-125	0	20 P6
Manganese	mg/kg	8040	49.5	47.6	7800	8030	-469	-22	75-125	3	20 P6
Nickel	mg/kg	113	49.5	47.6	148	147	70	71	75-125	1	20 M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Parameter	Units	2897685		2897686		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427793001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Silver	mg/kg	18.5	24.8	23.8	48.7	49.0	122	128	75-125	1	20	M1	
Tin	mg/kg	94.8	49.5	47.6	127	127	66	67	75-125	1	20	M1	
Titanium	mg/kg	1650	49.5	47.6	1620	1690	-64	67	75-125	4	20	P6	
Zinc	mg/kg	1960	49.5	47.6	1950	1930	-21	-53	75-125	1	20	P6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 438855 Analysis Method: EPA 6020

QC Batch Method: EPA 3050B Analysis Description: 6020 MET

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2027873 Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.19	04/26/18 02:38	N2

LABORATORY CONTROL SAMPLE: 2027874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.9	106	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027875 2027876

Parameter	Units	2027875		2027876		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	5.4	4.87	4.87	7.0	6.1	34	15	75-125	14	20 M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533412 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897671 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.48	04/21/18 02:51	
Arsenic	mg/kg	ND	0.48	04/21/18 02:51	
Beryllium	mg/kg	ND	0.19	04/21/18 02:51	
Cadmium	mg/kg	ND	0.076	04/21/18 02:51	
Cobalt	mg/kg	ND	0.48	04/21/18 02:51	
Lead	mg/kg	ND	0.095	04/23/18 17:49	
Lithium	mg/kg	ND	0.48	04/21/18 02:51	
Selenium	mg/kg	ND	0.48	04/21/18 02:51	
Strontium	mg/kg	ND	0.48	04/21/18 02:51	
Vanadium	mg/kg	ND	0.95	04/21/18 02:51	

LABORATORY CONTROL SAMPLE: 2897672

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	47.6	100	80-120	
Arsenic	mg/kg	47.6	47.9	101	80-120	
Beryllium	mg/kg	47.6	47.3	99	80-120	
Cadmium	mg/kg	47.6	47.1	99	80-120	
Cobalt	mg/kg	47.6	49.3	104	80-120	
Lead	mg/kg	47.6	48.7	102	80-120	
Lithium	mg/kg	47.6	45.4	95	80-120	
Selenium	mg/kg	47.6	47.6	100	80-120	
Strontium	mg/kg	47.6	47.2	99	80-120	
Vanadium	mg/kg	47.6	47.7	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897673 2897674

Parameter	Units	10427861001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Antimony	mg/kg	0.59	49.5	48.5	21.6	20.0	42	40	75-125	8	20	M6	
Arsenic	mg/kg	18.4	49.5	48.5	70.6	64.2	105	94	75-125	9	20		
Beryllium	mg/kg	0.60	49.5	48.5	46.4	44.0	92	90	75-125	5	20		
Cadmium	mg/kg	0.45	49.5	48.5	51.2	46.6	103	95	75-125	9	20		
Cobalt	mg/kg	6.1	49.5	48.5	59.2	53.9	107	99	75-125	9	20		
Lead	mg/kg	39.8	49.5	48.5	87.6	85.0	97	93	75-125	3	20		
Lithium	mg/kg	11.0	49.5	48.5	55.2	54.2	89	89	75-125	2	20		
Selenium	mg/kg	1.0	49.5	48.5	49.9	46.1	99	93	75-125	8	20		
Strontium	mg/kg	136	49.5	48.5	199	177	127	85	75-125	11	20	M6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2897673		2897674								
Parameter	Units	10427861001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Vanadium	mg/kg	22.3	49.5	48.5	76.0	68.8	108	96	75-125	10	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 534034

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

SAMPLE DUPLICATE: 2901166

Parameter	Units	10428311003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.7	14.8	8	30	

SAMPLE DUPLICATE: 2901255

Parameter	Units	10427906006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.4	21.5	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 534461 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2903647 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/26/18 13:11	
1,1-Dichloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,1-Dichloroethene	ug/kg	ND	50.0	04/26/18 13:11	
1,1-Dichloropropene	ug/kg	ND	50.0	04/26/18 13:11	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,2,3-Trichloropropane	ug/kg	ND	200	04/26/18 13:11	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/26/18 13:11	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/26/18 13:11	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,2-Dichloroethane	ug/kg	ND	50.0	04/26/18 13:11	
1,2-Dichloropropane	ug/kg	ND	50.0	04/26/18 13:11	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
1,3-Dichloropropane	ug/kg	ND	50.0	04/26/18 13:11	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
2,2-Dichloropropane	ug/kg	ND	200	04/26/18 13:11	
2-Butanone (MEK)	ug/kg	ND	250	04/26/18 13:11	
2-Chlorotoluene	ug/kg	ND	50.0	04/26/18 13:11	
4-Chlorotoluene	ug/kg	ND	50.0	04/26/18 13:11	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/26/18 13:11	
Acetone	ug/kg	ND	1000	04/26/18 13:11	
Allyl chloride	ug/kg	ND	200	04/26/18 13:11	
Benzene	ug/kg	ND	20.0	04/26/18 13:11	
Bromobenzene	ug/kg	ND	50.0	04/26/18 13:11	
Bromochloromethane	ug/kg	ND	50.0	04/26/18 13:11	
Bromodichloromethane	ug/kg	ND	50.0	04/26/18 13:11	
Bromoform	ug/kg	ND	500	04/26/18 13:11	MN
Bromomethane	ug/kg	ND	500	04/26/18 13:11	
Carbon tetrachloride	ug/kg	ND	50.0	04/26/18 13:11	
Chlorobenzene	ug/kg	ND	50.0	04/26/18 13:11	
Chloroethane	ug/kg	ND	500	04/26/18 13:11	
Chloroform	ug/kg	ND	50.0	04/26/18 13:11	
Chloromethane	ug/kg	ND	200	04/26/18 13:11	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/26/18 13:11	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/26/18 13:11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

METHOD BLANK: 2903647

Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/26/18 13:11	
Dibromomethane	ug/kg	ND	50.0	04/26/18 13:11	
Dichlorodifluoromethane	ug/kg	ND	200	04/26/18 13:11	
Dichlorofluoromethane	ug/kg	ND	500	04/26/18 13:11	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/26/18 13:11	
Ethylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/26/18 13:11	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/26/18 13:11	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/26/18 13:11	
Methylene Chloride	ug/kg	ND	200	04/26/18 13:11	
n-Butylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
n-Propylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
Naphthalene	ug/kg	ND	200	04/26/18 13:11	
p-Isopropyltoluene	ug/kg	ND	50.0	04/26/18 13:11	
sec-Butylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
Styrene	ug/kg	ND	50.0	04/26/18 13:11	
tert-Butylbenzene	ug/kg	ND	50.0	04/26/18 13:11	
Tetrachloroethene	ug/kg	ND	50.0	04/26/18 13:11	
Tetrahydrofuran	ug/kg	ND	2000	04/26/18 13:11	
Toluene	ug/kg	ND	50.0	04/26/18 13:11	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/26/18 13:11	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/26/18 13:11	
Trichloroethene	ug/kg	ND	50.0	04/26/18 13:11	
Trichlorofluoromethane	ug/kg	ND	200	04/26/18 13:11	
Vinyl chloride	ug/kg	ND	20.0	04/26/18 13:11	
Xylene (Total)	ug/kg	ND	150	04/26/18 13:11	
1,2-Dichloroethane-d4 (S)	%	95	75-125	04/26/18 13:11	
4-Bromofluorobenzene (S)	%	96	75-125	04/26/18 13:11	
Toluene-d8 (S)	%	96	75-125	04/26/18 13:11	

LABORATORY CONTROL SAMPLE & LCSD: 2903648

2903649

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	773	714	77	71	59-125	8	20	
1,1,1-Trichloroethane	ug/kg	1000	816	763	82	76	59-125	7	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	735	660	74	66	58-125	11	20	
1,1,2-Trichloroethane	ug/kg	1000	737	691	74	69	64-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	733	671	73	67	65-125	9	20	
1,1-Dichloroethane	ug/kg	1000	722	664	72	66	63-125	8	20	
1,1-Dichloroethene	ug/kg	1000	782	703	78	70	59-125	11	20	
1,1-Dichloropropene	ug/kg	1000	805	731	81	73	64-125	10	20	
1,2,3-Trichlorobenzene	ug/kg	1000	724	658	72	66	55-126	10	20	
1,2,3-Trichloropropane	ug/kg	1000	706	646	71	65	62-125	9	20	
1,2,4-Trichlorobenzene	ug/kg	1000	752	672	75	67	62-125	11	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE & LCSD: 2903648		2903649								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	737	661	74	66	59-125	11	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1730	1620	69	65	54-125	7	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	796	745	80	74	64-125	7	20	
1,2-Dichlorobenzene	ug/kg	1000	752	668	75	67	63-125	12	20	
1,2-Dichloroethane	ug/kg	1000	693	643	69	64	57-125	8	20	
1,2-Dichloropropane	ug/kg	1000	716	684	72	68	67-125	5	20	
1,3,5-Trimethylbenzene	ug/kg	1000	751	711	75	71	59-125	6	20	
1,3-Dichlorobenzene	ug/kg	1000	720	663	72	66	64-125	8	20	
1,3-Dichloropropane	ug/kg	1000	732	682	73	68	64-125	7	20	
1,4-Dichlorobenzene	ug/kg	1000	714	654	71	65	63-125	9	20	
2,2-Dichloropropane	ug/kg	1000	778	701	78	70	37-126	10	20	
2-Butanone (MEK)	ug/kg	5000	3310	3010	66	60	48-125	9	20	
2-Chlorotoluene	ug/kg	1000	721	671	72	67	62-125	7	20	
4-Chlorotoluene	ug/kg	1000	738	667	74	67	63-125	10	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3550	3140	71	63	52-135	12	20	
Acetone	ug/kg	5000	4320	4190	86	84	65-125	3	20	
Allyl chloride	ug/kg	1000	674	607	67	61	52-125	10	20	
Benzene	ug/kg	1000	751	691	75	69	61-125	8	20	
Bromobenzene	ug/kg	1000	766	664	77	66	64-125	14	20	
Bromochloromethane	ug/kg	1000	744	662	74	66	65-125	12	20	
Bromodichloromethane	ug/kg	1000	760	707	76	71	57-125	7	20	
Bromoform	ug/kg	1000	739	662	74	66	57-125	11	20	
Bromomethane	ug/kg	1000	816	783	82	78	60-125	4	20	
Carbon tetrachloride	ug/kg	1000	782	701	78	70	58-125	11	20	
Chlorobenzene	ug/kg	1000	719	681	72	68	66-125	5	20	
Chloroethane	ug/kg	1000	877	797	88	80	62-125	10	20	
Chloroform	ug/kg	1000	701	662	70	66	59-125	6	20	
Chloromethane	ug/kg	1000	802	747	80	75	50-125	7	20	
cis-1,2-Dichloroethene	ug/kg	1000	736	691	74	69	61-125	6	20	
cis-1,3-Dichloropropene	ug/kg	1000	770	735	77	74	61-125	5	20	
Dibromochloromethane	ug/kg	1000	706	663	71	66	60-125	6	20	
Dibromomethane	ug/kg	1000	774	700	77	70	69-125	10	20	
Dichlorodifluoromethane	ug/kg	1000	860	775	86	78	38-125	10	20	
Dichlorofluoromethane	ug/kg	1000	950	917	95	92	67-125	3	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1150	1270	115	127	60-125	10	20	CH,L3,SS
Ethylbenzene	ug/kg	1000	760	699	76	70	62-125	8	20	
Hexachloro-1,3-butadiene	ug/kg	1000	773	692	77	69	56-125	11	20	
Isopropylbenzene (Cumene)	ug/kg	1000	807	746	81	75	65-125	8	20	
Methyl-tert-butyl ether	ug/kg	1000	698	646	70	65	59-125	8	20	
Methylene Chloride	ug/kg	1000	674	594	67	59	64-125	13	20	L2
n-Butylbenzene	ug/kg	1000	776	697	78	70	59-125	11	20	
n-Propylbenzene	ug/kg	1000	740	677	74	68	61-125	9	20	
Naphthalene	ug/kg	1000	740	692	74	69	53-125	7	20	
p-Isopropyltoluene	ug/kg	1000	763	724	76	72	63-125	5	20	
sec-Butylbenzene	ug/kg	1000	750	687	75	69	62-125	9	20	
Styrene	ug/kg	1000	790	695	79	69	66-125	13	20	
tert-Butylbenzene	ug/kg	1000	741	668	74	67	64-125	10	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE & LCSD: 2903648

2903649

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Tetrachloroethene	ug/kg	1000	821	741	82	74	67-125	10	20	
Tetrahydrofuran	ug/kg	10000	7750	7440	77	74	62-125	4	20	
Toluene	ug/kg	1000	707	648	71	65	61-125	9	20	
trans-1,2-Dichloroethene	ug/kg	1000	798	730	80	73	64-125	9	20	
trans-1,3-Dichloropropene	ug/kg	1000	791	727	79	73	56-125	8	20	
Trichloroethene	ug/kg	1000	756	699	76	70	67-125	8	20	
Trichlorofluoromethane	ug/kg	1000	999	965	100	97	65-125	3	20	
Vinyl chloride	ug/kg	1000	929	841	93	84	57-125	10	20	
Xylene (Total)	ug/kg	3000	2210	2030	74	68	62-125	8	20	
1,2-Dichloroethane-d4 (S)	%				95	93	75-125			
4-Bromofluorobenzene (S)	%				98	101	75-125			
Toluene-d8 (S)	%				100	101	75-125			

MATRIX SPIKE SAMPLE: 2903650

Parameter	Units	10427642001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	1320	1480	112	64-146	
1,1,1-Trichloroethane	ug/kg	ND	1320	1510	114	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1320	1470	112	36-150	
1,1,2-Trichloroethane	ug/kg	ND	1320	1430	108	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1320	1310	99	60-142	
1,1-Dichloroethane	ug/kg	ND	1320	1370	103	57-140	
1,1-Dichloroethene	ug/kg	ND	1320	1350	102	59-139	
1,1-Dichloropropene	ug/kg	ND	1320	1470	111	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	1320	1440	109	69-150	
1,2,3-Trichloropropane	ug/kg	ND	1320	1410	107	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1320	1490	113	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	1320	1430	108	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	3310	3600	109	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1320	1540	117	67-147	
1,2-Dichlorobenzene	ug/kg	ND	1320	1430	108	70-142	
1,2-Dichloroethane	ug/kg	ND	1320	1310	99	58-132	
1,2-Dichloropropane	ug/kg	ND	1320	1400	106	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	1320	1430	108	71-146	
1,3-Dichlorobenzene	ug/kg	ND	1320	1410	107	71-142	
1,3-Dichloropropane	ug/kg	ND	1320	1420	108	68-140	
1,4-Dichlorobenzene	ug/kg	ND	1320	1330	101	68-142	
2,2-Dichloropropane	ug/kg	ND	1320	1470	111	34-150	
2-Butanone (MEK)	ug/kg	ND	6610	7390	112	51-150	
2-Chlorotoluene	ug/kg	ND	1320	1430	108	66-144	
4-Chlorotoluene	ug/kg	ND	1320	1380	104	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	6610	6890	104	63-150	
Acetone	ug/kg	ND	6610	9080	137	54-150	
Allyl chloride	ug/kg	ND	1320	1250	95	53-135	
Benzene	ug/kg	ND	1320	1420	107	65-135	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

MATRIX SPIKE SAMPLE: 2903650		10427642001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1320	1450	110	71-141	
Bromochloromethane	ug/kg	ND	1320	1340	102	62-145	
Bromodichloromethane	ug/kg	ND	1320	1460	110	59-148	
Bromoform	ug/kg	ND	1320	1380	105	57-145	
Bromomethane	ug/kg	ND	1320	1310	99	51-129	
Carbon tetrachloride	ug/kg	ND	1320	1490	113	55-144	
Chlorobenzene	ug/kg	ND	1320	1400	106	70-142	
Chloroethane	ug/kg	ND	1320	1400	106	61-135	
Chloroform	ug/kg	ND	1320	1340	102	58-135	
Chloromethane	ug/kg	ND	1320	1180	89	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1320	1410	106	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1320	1510	114	62-142	
Dibromochloromethane	ug/kg	ND	1320	1390	105	65-141	
Dibromomethane	ug/kg	ND	1320	1420	107	72-150	
Dichlorodifluoromethane	ug/kg	ND	1320	1010	77	30-125	
Dichlorofluoromethane	ug/kg	ND	1320	1510	114	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1320	2970	225	62-135	CH,M0,SS
Ethylbenzene	ug/kg	ND	1320	1460	111	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1320	1780	135	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1320	1530	116	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1320	1370	104	63-139	
Methylene Chloride	ug/kg	ND	1320	1280	97	58-135	
n-Butylbenzene	ug/kg	ND	1320	1520	115	63-150	
n-Propylbenzene	ug/kg	ND	1320	1430	108	70-146	
Naphthalene	ug/kg	ND	1320	1450	110	63-150	
p-Isopropyltoluene	ug/kg	ND	1320	1520	115	72-150	
sec-Butylbenzene	ug/kg	ND	1320	1440	109	66-150	
Styrene	ug/kg	ND	1320	1480	112	72-146	
tert-Butylbenzene	ug/kg	ND	1320	1470	111	71-148	
Tetrachloroethene	ug/kg	ND	1320	1570	118	70-150	
Tetrahydrofuran	ug/kg	ND	13200	15000	113	62-150	
Toluene	ug/kg	ND	1320	1350	102	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1320	1470	111	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1320	1490	113	57-147	
Trichloroethene	ug/kg	ND	1320	1470	111	62-150	
Trichlorofluoromethane	ug/kg	ND	1320	1600	121	51-150	
Vinyl chloride	ug/kg	ND	1320	1330	101	45-132	
Xylene (Total)	ug/kg	ND	3970	4260	107	75-140	
1,2-Dichloroethane-d4 (S)	%					94	75-125
4-Bromofluorobenzene (S)	%					98	75-125
Toluene-d8 (S)	%					99	75-125

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

SAMPLE DUPLICATE: 2903753

Parameter	Units	10427642005 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	538	2900	137	30	D6
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	173		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	156	1030	147	30	D6
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	381		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	435	4490	165	30	D6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

SAMPLE DUPLICATE: 2903753

Parameter	Units	10427642005 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	262		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	391		30	
n-Propylbenzene	ug/kg	ND	544		30	
Naphthalene	ug/kg	972	22500	183	30	D6
p-Isopropyltoluene	ug/kg	ND	601		30	
sec-Butylbenzene	ug/kg	ND	289		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	226		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	127J		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	1350	11900	159	30	D6
1,2-Dichloroethane-d4 (S)	%	94	94	5		1M
4-Bromofluorobenzene (S)	%	101	95	1		
Toluene-d8 (S)	%	96	97	7		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533317 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2896992 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/26/18 20:33	
4,4'-DDE	ug/kg	ND	3.3	04/26/18 20:33	
4,4'-DDT	ug/kg	ND	3.3	04/26/18 20:33	
Aldrin	ug/kg	ND	1.7	04/26/18 20:33	
alpha-BHC	ug/kg	ND	1.7	04/26/18 20:33	
alpha-Chlordane	ug/kg	ND	1.7	04/26/18 20:33	
beta-BHC	ug/kg	ND	1.7	04/26/18 20:33	
Chlordane (Technical)	ug/kg	ND	16.7	04/26/18 20:33	
delta-BHC	ug/kg	ND	1.7	04/26/18 20:33	
Dieldrin	ug/kg	ND	3.3	04/26/18 20:33	
Endosulfan I	ug/kg	ND	1.7	04/26/18 20:33	
Endosulfan II	ug/kg	ND	3.3	04/26/18 20:33	
Endosulfan sulfate	ug/kg	ND	3.3	04/26/18 20:33	
Endrin	ug/kg	ND	3.3	04/26/18 20:33	
Endrin aldehyde	ug/kg	ND	3.3	04/26/18 20:33	
Endrin ketone	ug/kg	ND	3.3	04/26/18 20:33	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/26/18 20:33	
gamma-Chlordane	ug/kg	ND	1.7	04/26/18 20:33	
Heptachlor	ug/kg	ND	1.7	04/26/18 20:33	
Heptachlor epoxide	ug/kg	ND	1.7	04/26/18 20:33	
Methoxychlor	ug/kg	ND	16.7	04/26/18 20:33	
Toxaphene	ug/kg	ND	50.0	04/26/18 20:33	
Decachlorobiphenyl (S)	%	98	30-150	04/26/18 20:33	
Tetrachloro-m-xylene (S)	%	105	30-150	04/26/18 20:33	

LABORATORY CONTROL SAMPLE: 2896993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	35.6	107	62-127	
4,4'-DDE	ug/kg	33.3	34.8	104	66-125	
4,4'-DDT	ug/kg	33.3	31.8	96	67-128	
Aldrin	ug/kg	16.7	16.5	99	66-125	
alpha-BHC	ug/kg	16.7	17.5	105	64-125	
alpha-Chlordane	ug/kg	16.7	16.7	100	68-125	
beta-BHC	ug/kg	16.7	16.8	101	69-125	
delta-BHC	ug/kg	16.7	14.3	86	42-133	
Dieldrin	ug/kg	33.3	37.3	112	69-126	
Endosulfan I	ug/kg	16.7	16.0	96	63-125	
Endosulfan II	ug/kg	33.3	35.8	107	69-125	
Endosulfan sulfate	ug/kg	33.3	31.8	95	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE: 2896993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	34.5	103	69-125	
Endrin aldehyde	ug/kg	33.3	34.0	102	65-125	
Endrin ketone	ug/kg	33.3	36.0	108	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	17.4	104	67-125	
gamma-Chlordane	ug/kg	16.7	15.3	92	63-125	
Heptachlor	ug/kg	16.7	16.5	99	69-125	
Heptachlor epoxide	ug/kg	16.7	17.0	102	68-125	
Methoxychlor	ug/kg	167	160	96	65-134	
Decachlorobiphenyl (S)	%			100	30-150	
Tetrachloro-m-xylene (S)	%			107	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896994 2896995

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427824001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	43.8	43.8	79J	92J	180	210	56-125	20	M6
4,4'-DDE	ug/kg	ND	43.8	43.8	61.7J	61.2J	141	140	32-150	20	
4,4'-DDT	ug/kg	ND	43.8	43.8	ND	105J	49	239	60-132	20	M6
Aldrin	ug/kg	ND	21.9	21.9	29.1J	43.3J	133	198	56-125	20	M6
alpha-BHC	ug/kg	ND	21.9	21.9	30.3J	25.5J	138	116	54-136	20	M6
alpha-Chlordane	ug/kg	ND	21.9	21.9	43.8J	97.5J	200	445	54-133	20	M6
beta-BHC	ug/kg	ND	21.9	21.9	ND	69.2J	190	315	30-150	20	M6
delta-BHC	ug/kg	ND	21.9	21.9	21.3J	19.8J	97	90	45-145	20	
Dieldrin	ug/kg	ND	43.8	43.8	67.4J	76.3J	154	174	47-150	20	M6
Endosulfan I	ug/kg	ND	21.9	21.9	23.9J	22.6J	109	103	35-145	20	
Endosulfan II	ug/kg	ND	43.8	43.8	53.3J	50.6J	122	115	50-147	20	
Endosulfan sulfate	ug/kg	ND	43.8	43.8	44.3J	43.8J	101	100	54-132	20	
Endrin	ug/kg	ND	43.8	43.8	49.3J	39.3J	113	90	62-125	20	
Endrin aldehyde	ug/kg	ND	43.8	43.8	48.2J	49.1J	110	112	33-150	20	
Endrin ketone	ug/kg	ND	43.8	43.8	83.8J	97.2J	191	222	56-144	20	M6
gamma-BHC (Lindane)	ug/kg	ND	21.9	21.9	26.3J	27.8J	120	127	63-125	20	M6
gamma-Chlordane	ug/kg	ND	21.9	21.9	43.3J	88.3J	198	403	45-132	20	M6
Heptachlor	ug/kg	ND	21.9	21.9	33.4J	24.2J	152	110	51-142	20	M6
Heptachlor epoxide	ug/kg	ND	21.9	21.9	27.4J	27J	125	123	50-142	20	
Methoxychlor	ug/kg	ND	219	219	261J	243J	119	111	58-139	20	
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		3M, D3, S4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533330 Analysis Method: EPA 8082A
 QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897062 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/23/18 17:02	
Decachlorobiphenyl (S)	%	125	30-134	04/23/18 17:02	CH
Tetrachloro-m-xylene (S)	%	88	48-125	04/23/18 17:02	

LABORATORY CONTROL SAMPLE: 2897063

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	502	75	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	549	82	62-125	
Decachlorobiphenyl (S)	%			126	30-134	CH
Tetrachloro-m-xylene (S)	%			88	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897064 2897065

Parameter	Units	10427642001		2897065		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
PCB-1016 (Aroclor 1016)	ug/kg	ND	853	852	783	92	101	30-150	9	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	853	852	757	89	88	30-138	1	30	
Decachlorobiphenyl (S)	%					110	108	30-134			CH
Tetrachloro-m-xylene (S)	%					78	75	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533315 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2896984 Matrix: Solid
Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,2-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/23/18 16:07	
1,3-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,4-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1-Methylnaphthalene	ug/kg	ND	330	04/23/18 16:07	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dimethylphenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dinitrophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dinitrotoluene	ug/kg	ND	330	04/23/18 16:07	
2,6-Dinitrotoluene	ug/kg	ND	330	04/23/18 16:07	
2-Chloronaphthalene	ug/kg	ND	330	04/23/18 16:07	
2-Chlorophenol	ug/kg	ND	330	04/23/18 16:07	
2-Methylnaphthalene	ug/kg	ND	330	04/23/18 16:07	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/23/18 16:07	
2-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
2-Nitrophenol	ug/kg	ND	330	04/23/18 16:07	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/23/18 16:07	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/23/18 16:07	
3-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/23/18 16:07	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/23/18 16:07	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/23/18 16:07	
4-Chloroaniline	ug/kg	ND	330	04/23/18 16:07	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/23/18 16:07	
4-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
4-Nitrophenol	ug/kg	ND	330	04/23/18 16:07	
Acenaphthene	ug/kg	ND	330	04/23/18 16:07	
Acenaphthylene	ug/kg	ND	330	04/23/18 16:07	
Anthracene	ug/kg	ND	330	04/23/18 16:07	
Benzo(a)anthracene	ug/kg	ND	330	04/23/18 16:07	
Benzo(a)pyrene	ug/kg	ND	330	04/23/18 16:07	
Benzo(b)fluoranthene	ug/kg	ND	330	04/23/18 16:07	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/23/18 16:07	
Benzo(k)fluoranthene	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/23/18 16:07	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/23/18 16:07	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

METHOD BLANK: 2896984

Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/23/18 16:07	
Carbazole	ug/kg	ND	330	04/23/18 16:07	
Chrysene	ug/kg	ND	330	04/23/18 16:07	
Di-n-butylphthalate	ug/kg	ND	330	04/23/18 16:07	
Di-n-octylphthalate	ug/kg	ND	330	04/23/18 16:07	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/23/18 16:07	
Dibenzofuran	ug/kg	ND	330	04/23/18 16:07	
Diethylphthalate	ug/kg	ND	330	04/23/18 16:07	
Dimethylphthalate	ug/kg	ND	330	04/23/18 16:07	
Fluoranthene	ug/kg	ND	330	04/23/18 16:07	
Fluorene	ug/kg	ND	330	04/23/18 16:07	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/23/18 16:07	
Hexachlorobenzene	ug/kg	ND	330	04/23/18 16:07	
Hexachloroethane	ug/kg	ND	330	04/23/18 16:07	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/23/18 16:07	
Isophorone	ug/kg	ND	330	04/23/18 16:07	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/23/18 16:07	
N-Nitrosodimethylamine	ug/kg	ND	330	04/23/18 16:07	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/23/18 16:07	
Naphthalene	ug/kg	ND	330	04/23/18 16:07	
Nitrobenzene	ug/kg	ND	330	04/23/18 16:07	
Pentachlorophenol	ug/kg	ND	670	04/23/18 16:07	
Phenanthrene	ug/kg	ND	330	04/23/18 16:07	
Phenol	ug/kg	ND	330	04/23/18 16:07	
Pyrene	ug/kg	ND	330	04/23/18 16:07	
2,4,6-Tribromophenol (S)	%	69	60-125	04/23/18 16:07	
2-Fluorobiphenyl (S)	%	67	30-132	04/23/18 16:07	
2-Fluorophenol (S)	%	64	40-125	04/23/18 16:07	
Nitrobenzene-d5 (S)	%	63	43-125	04/23/18 16:07	
p-Terphenyl-d14 (S)	%	79	62-125	04/23/18 16:07	
Phenol-d6 (S)	%	63	48-125	04/23/18 16:07	

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1210	73	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1230	74	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1300	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1230	74	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1220	73	39-125	
1-Methylnaphthalene	ug/kg	1670	1320	79	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1340	81	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1310	79	61-125	
2,4-Dichlorophenol	ug/kg	1670	1370	82	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1280	77	51-125	
2,4-Dinitrophenol	ug/kg	1670	1130	68	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1550	93	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1470	88	63-125	
2-Chloronaphthalene	ug/kg	1670	1310	79	61-125	
2-Chlorophenol	ug/kg	1670	1230	74	46-125	
2-Methylnaphthalene	ug/kg	1670	1290	77	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1240	74	50-125	
2-Nitroaniline	ug/kg	1670	1350	81	61-125	
2-Nitrophenol	ug/kg	1670	1340	80	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1290	77	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1370	82	47-125	
3-Nitroaniline	ug/kg	1670	1370	82	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1540J	93	30-141	7M
4-Bromophenylphenyl ether	ug/kg	1670	1340	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1420	85	64-125	
4-Chloroaniline	ug/kg	1670	1080	65	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1350	81	64-125	
4-Nitroaniline	ug/kg	1670	1330	80	59-125	
4-Nitrophenol	ug/kg	1670	1240	75	54-125	
Acenaphthene	ug/kg	1670	1310	79	62-125	
Acenaphthylene	ug/kg	1670	1330	80	61-125	
Anthracene	ug/kg	1670	1350	81	66-125	
Benzo(a)anthracene	ug/kg	1670	1430	86	69-125	
Benzo(a)pyrene	ug/kg	1670	1410	85	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1440	87	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1450	87	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1400	84	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1230	74	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1130	68	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	978	59	37-125	7M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1600	96	69-131	
Butylbenzylphthalate	ug/kg	1670	1550	93	69-129	
Carbazole	ug/kg	1670	1430	86	66-125	
Chrysene	ug/kg	1670	1410	85	68-125	
Di-n-butylphthalate	ug/kg	1670	1520	91	69-125	
Di-n-octylphthalate	ug/kg	1670	1640	98	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1480	89	64-125	
Dibenzofuran	ug/kg	1670	1380	83	65-125	
Diethylphthalate	ug/kg	1670	1420	85	67-125	
Dimethylphthalate	ug/kg	1670	1420	85	67-125	
Fluoranthene	ug/kg	1670	1410	85	66-125	
Fluorene	ug/kg	1670	1370	82	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1190	71	40-125	
Hexachlorobenzene	ug/kg	1670	1370	82	62-125	
Hexachloroethane	ug/kg	1670	1190	72	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1450	87	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1260	76	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1220	73	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1330	80	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1410	85	65-125	
Naphthalene	ug/kg	1670	1240	74	48-125	
Nitrobenzene	ug/kg	1670	1200	72	48-125	
Pentachlorophenol	ug/kg	1670	1120	67	41-125	
Phenanthrene	ug/kg	1670	1350	81	66-125	
Phenol	ug/kg	1670	1210	73	46-125	
Pyrene	ug/kg	1670	1460	88	69-125	
2,4,6-Tribromophenol (S)	%			76	60-125	
2-Fluorobiphenyl (S)	%			68	30-132	
2-Fluorophenol (S)	%			61	40-125	
Nitrobenzene-d5 (S)	%			59	43-125	
p-Terphenyl-d14 (S)	%			82	62-125	
Phenol-d6 (S)	%			63	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896986 2896987

Parameter	Units	10427642001		MSD		MSD		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,2,4-Trichlorobenzene	ug/kg	ND	2130	2140	1630	1720	77	81	30-127	5	30		
1,2-Dichlorobenzene	ug/kg	ND	2130	2140	1610	1550	76	73	30-125	3	30		
1,2-Diphenylhydrazine	ug/kg	ND	2130	2140	1560	1800	73	84	30-150	15	30		
1,3-Dichlorobenzene	ug/kg	ND	2130	2140	1570	1470	74	69	30-125	7	30		
1,4-Dichlorobenzene	ug/kg	ND	2130	2140	1570	1500	74	70	30-125	5	30		
1-Methylnaphthalene	ug/kg	ND	2130	2140	1740	1900	81	89	42-125	9	30		
2,4,5-Trichlorophenol	ug/kg	ND	2130	2140	1690	1950	80	91	30-150	14	30		
2,4,6-Trichlorophenol	ug/kg	ND	2130	2140	1750	1990	82	93	30-150	13	30		
2,4-Dichlorophenol	ug/kg	ND	2130	2140	1820	1980	85	93	30-135	8	30		
2,4-Dimethylphenol	ug/kg	ND	2130	2140	1770	1930	83	90	30-148	9	30		
2,4-Dinitrophenol	ug/kg	ND	2130	2140	ND	ND	0	0	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	ND	2130	2140	1630	1760	77	82	30-150	7	30		
2,6-Dinitrotoluene	ug/kg	ND	2130	2140	1630	1820	77	85	30-150	11	30		
2-Chloronaphthalene	ug/kg	ND	2130	2140	1700	1930	80	90	30-138	13	30		
2-Chlorophenol	ug/kg	ND	2130	2140	1680	1720	79	80	30-130	2	30		
2-Methylnaphthalene	ug/kg	ND	2130	2140	1700	1860	79	87	46-125	9	30		
2-Methylphenol(o-Cresol)	ug/kg	ND	2130	2140	1720	1840	81	86	30-133	6	30		
2-Nitroaniline	ug/kg	ND	2130	2140	1830	2180	86	102	30-150	17	30		
2-Nitrophenol	ug/kg	ND	2130	2140	1360	1410	64	66	30-134	4	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	2130	2140	1740	1870	82	88	30-138	7	30		
3,3'-Dichlorobenzidine	ug/kg	ND	2130	2140	1780	1880	84	88	30-149	5	30		
3-Nitroaniline	ug/kg	ND	2130	2140	1680	1930	79	91	30-150	14	30		
4,6-Dinitro-2-methylphenol	ug/kg	ND	2130	2140	259J	ND	12	0	30-133		30	7M, M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896986 2896987												
Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		10427642001	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
4-Bromophenylphenyl ether	ug/kg	ND	2130	2140	1750	1930	82	90	44-125	9	30	
4-Chloro-3-methylphenol	ug/kg	ND	2130	2140	1910	2070	90	97	30-150	8	30	
4-Chloroaniline	ug/kg	ND	2130	2140	996	1070	47	50	30-125	7	30	
4-Chlorophenylphenyl ether	ug/kg	ND	2130	2140	1710	1990	81	93	44-125	15	30	
4-Nitroaniline	ug/kg	ND	2130	2140	1850	2240	87	105	30-150	19	30	
4-Nitrophenol	ug/kg	ND	2130	2140	1520	1800	71	84	30-150	17	30	
Acenaphthene	ug/kg	ND	2130	2140	1610	1840	73	84	40-125	13	30	
Acenaphthylene	ug/kg	ND	2130	2140	1690	1910	79	90	30-150	13	30	
Anthracene	ug/kg	ND	2130	2140	1760	1990	77	88	30-150	13	30	
Benzo(a)anthracene	ug/kg	ND	2130	2140	2080	2270	85	94	30-150	9	30	
Benzo(a)pyrene	ug/kg	ND	2130	2140	1990	2290	81	95	30-150	14	30	
Benzo(b)fluoranthene	ug/kg	ND	2130	2140	2120	2370	83	95	30-150	11	30	
Benzo(g,h,i)perylene	ug/kg	ND	2130	2140	1920	2210	82	95	30-150	14	30	
Benzo(k)fluoranthene	ug/kg	ND	2130	2140	1940	2190	84	95	30-150	12	30	
bis(2-Chloroethoxy)methane	ug/kg	ND	2130	2140	1670	1760	78	83	30-134	6	30	
bis(2-Chloroethyl) ether	ug/kg	ND	2130	2140	1590	1570	75	74	30-125	1	30	
bis(2-Chloroisopropyl) ether	ug/kg	ND	2130	2140	1300	1290	61	61	30-125	0	30	7M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	2130	2140	2220	2540	98	113	30-150	14	30	
Butylbenzylphthalate	ug/kg	ND	2130	2140	2110	2580	97	119	30-150	20	30	
Carbazole	ug/kg	ND	2130	2140	1800	2040	82	93	41-125	12	30	
Chrysene	ug/kg	ND	2130	2140	2040	2290	83	95	30-150	11	30	
Di-n-butylphthalate	ug/kg	ND	2130	2140	1880	2150	88	101	30-150	14	30	
Di-n-octylphthalate	ug/kg	ND	2130	2140	2090	2370	98	111	30-150	13	30	
Dibenz(a,h)anthracene	ug/kg	ND	2130	2140	1870	2110	88	99	30-150	12	30	
Dibenzofuran	ug/kg	ND	2130	2140	1720	1980	80	92	45-125	14	30	
Diethylphthalate	ug/kg	ND	2130	2140	1760	2070	83	97	30-150	16	30	
Dimethylphthalate	ug/kg	ND	2130	2140	1800	2040	85	96	30-150	12	30	
Fluoranthene	ug/kg	565	2130	2140	2230	2380	78	85	30-150	7	30	
Fluorene	ug/kg	ND	2130	2140	1710	1950	78	89	30-150	13	30	
Hexachloro-1,3-butadiene	ug/kg	ND	2130	2140	1600	1620	75	76	30-128	2	30	
Hexachlorobenzene	ug/kg	ND	2130	2140	1760	1950	83	91	30-150	10	30	
Hexachloroethane	ug/kg	ND	2130	2140	642	673	30	32	30-125	5	30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	2130	2140	1930	2210	84	97	30-150	14	30	
Isophorone	ug/kg	ND	2130	2140	1650	1750	78	82	30-140	6	30	
N-Nitroso-di-n-propylamine	ug/kg	ND	2130	2140	1610	1670	76	78	30-147	3	30	
N-Nitrosodimethylamine	ug/kg	ND	2130	2140	1640	1450	77	68	30-125	12	30	
N-Nitrosodiphenylamine	ug/kg	ND	2130	2140	1810	2020	85	94	30-150	11	30	
Naphthalene	ug/kg	ND	2130	2140	1660	1730	78	81	44-125	4	30	
Nitrobenzene	ug/kg	ND	2130	2140	1600	1640	75	77	30-136	2	30	
Pentachlorophenol	ug/kg	ND	2130	2140	1430	1530	67	72	30-150	7	30	
Phenanthrene	ug/kg	ND	2130	2140	1800	2050	67	79	30-150	13	30	
Phenol	ug/kg	ND	2130	2140	1600	1720	75	81	30-129	7	30	
Pyrene	ug/kg	511	2130	2140	2370	2530	87	95	30-150	7	30	
2,4,6-Tribromophenol (S)	%						69	80	60-125			
2-Fluorobiphenyl (S)	%						49	53	30-132			
2-Fluorophenol (S)	%						63	59	40-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Parameter	Units	2896986		2896987		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrobenzene-d5 (S)	%.					57	54	43-125			
p-Terphenyl-d14 (S)	%.					76	86	62-125			
Phenol-d6 (S)	%.					64	65	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533341 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2897115 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/20/18 12:15	
Acenaphthylene	ug/kg	ND	10.0	04/20/18 12:15	
Anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(a)anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(a)pyrene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Chrysene	ug/kg	ND	10.0	04/20/18 12:15	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Fluorene	ug/kg	ND	10.0	04/20/18 12:15	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/20/18 12:15	
Naphthalene	ug/kg	ND	10.0	04/20/18 12:15	
Phenanthrene	ug/kg	ND	10.0	04/20/18 12:15	
Pyrene	ug/kg	ND	10.0	04/20/18 12:15	
2-Fluorobiphenyl (S)	%	72	42-125	04/20/18 12:15	
p-Terphenyl-d14 (S)	%	88	57-125	04/20/18 12:15	

LABORATORY CONTROL SAMPLE: 2897116

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	25.3	76	52-125	
Acenaphthylene	ug/kg	33.3	24.9	75	50-125	
Anthracene	ug/kg	33.3	26.9	81	65-125	
Benzo(a)anthracene	ug/kg	33.3	29.0	87	60-125	
Benzo(a)pyrene	ug/kg	33.3	27.9	84	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	30.3	91	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	29.6	89	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	30.6	92	67-125	
Chrysene	ug/kg	33.3	30.1	90	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	30.5	92	63-125	
Fluoranthene	ug/kg	33.3	29.5	88	75-125	
Fluorene	ug/kg	33.3	25.5	77	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	30.0	90	63-125	
Naphthalene	ug/kg	33.3	24.8	75	49-125	
Phenanthrene	ug/kg	33.3	27.8	83	65-125	
Pyrene	ug/kg	33.3	28.2	85	64-125	
2-Fluorobiphenyl (S)	%			76	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2897117		2897118									
Parameter	Units	10427642004	MS	MSD	MS	MSD	MS	MSD	% Rec	Max			
		Result	Spike	Spike	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual	
Acenaphthene	ug/kg	49.1	46	46.2	130	103	177	117	30-125	24	30	M1	
Acenaphthylene	ug/kg	ND	46	46.2	37.4	38.8	81	84	30-133	4	30		
Anthracene	ug/kg	94.1	46	46.2	96.2	163	4	149	30-150	51	30	M1, R1	
Benzo(a)anthracene	ug/kg	660	46	46.2	111	85.5	-1190	-1250	30-150	25	30	M1	
Benzo(a)pyrene	ug/kg	680	46	46.2	109	79.9	-1240	-1300	30-150	31	30	M1, R1	
Benzo(b)fluoranthene	ug/kg	879	46	46.2	138	101	-1610	-1690	30-150	31	30	M1, R1	
Benzo(g,h,i)perylene	ug/kg	358	46	46.2	81.6	66.3	-599	-632	30-150	21	30	M1	
Benzo(k)fluoranthene	ug/kg	293	46	46.2	75.1	59.2	-473	-507	30-150	24	30	M1	
Chrysene	ug/kg	570	46	46.2	112	101	-996	-1020	30-150	10	30	M1	
Dibenz(a,h)anthracene	ug/kg	88.8	46	46.2	49.0	45.5	-86	-94	30-131	7	30	M1	
Fluoranthene	ug/kg	1040	46	46.2	241	169	-1720	-1880	30-150	35	30	M1, R1	
Fluorene	ug/kg	43.3	46	46.2	96.7	112	116	148	30-147	14	30	M1	
Indeno(1,2,3-cd)pyrene	ug/kg	308	46	46.2	71.6	62.1	-514	-534	30-150	14	30	M1	
Naphthalene	ug/kg	106	46	46.2	222	190	252	182	30-131	16	30	M1	
Phenanthrene	ug/kg	318	46	46.2	240	256	-169	-135	30-150	6	30	M1	
Pyrene	ug/kg	872	46	46.2	191	139	-1480	-1590	30-150	32	30	M1, R1	
2-Fluorobiphenyl (S)	%.						81	83	42-125				
p-Terphenyl-d14 (S)	%.						82	90	57-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 533207 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2896541 Matrix: Solid

Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/20/18 15:21	
n-Triacontane (S)	%.	90	50-150	04/20/18 15:21	

LABORATORY CONTROL SAMPLE & LCSD: 2896542

2896543

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	72.5	70.0	91	87	70-120	4	20	
n-Triacontane (S)	%.				98	89	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

QC Batch: 438492 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10427642001

METHOD BLANK: 2026403 Matrix: Solid
Associated Lab Samples: 10427642001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/24/18 13:00	

LABORATORY CONTROL SAMPLE: 2026404

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1010	924	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026421 2026422

Parameter	Units	10427291008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	1080	1150	839	962	77	84	75-125	14	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026423 2026424

Parameter	Units	10427291008 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	42.9	42.7	28.6	29.2	67	68	75-125	2	20	M3

SAMPLE DUPLICATE: 2026425

Parameter	Units	10427354004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

QC Batch: 439469 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 2030574 Matrix: Solid
Associated Lab Samples: 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/30/18 13:42	

LABORATORY CONTROL SAMPLE: 2030575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1100	980	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030576 2030577

Parameter	Units	50194874001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1180	1120	1190	1120	100	100	75-125	6	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030578 2030579

Parameter	Units	50194874001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	46.6	46.4	28.6	26.1	54	49	75-125	9	20	M3

SAMPLE DUPLICATE: 2030580

Parameter	Units	10427642002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 286937 Analysis Method: EPA 9012
 QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 1678360 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/25/18 13:16	

LABORATORY CONTROL SAMPLE: 1678361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678362 1678363

Parameter	Units	10427642001		1678362		1678363		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Cyanide	mg/kg	0.52	3.72	3.72	4.0	4.1	93	97	80-120	4	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678364 1678365

Parameter	Units	10428096003		1678364		1678365		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Cyanide	mg/kg	0.45	2.7	2.6	3.5	2.7	112	87	80-120	25	20 M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

QC Batch: 141337 Analysis Method: EPA 9056A
 QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

METHOD BLANK: 559083 Matrix: Solid
 Associated Lab Samples: 10427642001, 10427642002, 10427642003, 10427642004, 10427642005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/25/18 23:33	

LABORATORY CONTROL SAMPLE: 559082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	49.8	55.2	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559084 559085

Parameter	Units	10427642003 Result	559084		559085		% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Fluoride	mg/kg	ND	49.3	49.7	34.2	29.5	69	59	80-120	15	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559086 559087

Parameter	Units	10427642001 Result	559086		559087		% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Fluoride	mg/kg	ND	50.5	49.3	21.2	19.1	42	39	80-120	10	20	M1

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427642

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M Analysis suggests sample and QC sample duplicate are non-homogeneous. Results confirmed by second analysis.

2M Sample was black in color and slightly viscous. Sample was centrifuged and decanted prior to analysis.

3M Sample was black in color and viscous. Sample was centrifuged and decanted prior to analysis.

4M Sample was black in color.

5M Sample was brown in color.

6M Sample was dark brown in color.

7M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

ANALYTE QUALIFIERS

- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- D4 Sample was diluted due to the presence of high levels of target analytes.
- D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
- T6 High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427642

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427642001	FD-TT-09 (4-12 WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642002	FD-TT-10 (2'-10' WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642003	FD-TT-11 (4-12 WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642004	FD-TT-12 (3-12)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642005	FD-TT-13 (3-12)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427642001	FD-TT-09 (4-12 WM)	EPA 3550	533317	EPA 8081B	534051
10427642002	FD-TT-10 (2'-10' WM)	EPA 3550	533317	EPA 8081B	534051
10427642003	FD-TT-11 (4-12 WM)	EPA 3550	533317	EPA 8081B	534051
10427642004	FD-TT-12 (3-12)	EPA 3550	533317	EPA 8081B	534051
10427642005	FD-TT-13 (3-12)	EPA 3550	533317	EPA 8081B	534051
10427642001	FD-TT-09 (4-12 WM)	EPA 3550	533330	EPA 8082A	533720
10427642002	FD-TT-10 (2'-10' WM)	EPA 3550	533330	EPA 8082A	533720
10427642003	FD-TT-11 (4-12 WM)	EPA 3550	533330	EPA 8082A	533720
10427642004	FD-TT-12 (3-12)	EPA 3550	533330	EPA 8082A	533720
10427642005	FD-TT-13 (3-12)	EPA 3550	533330	EPA 8082A	533720
10427642001	FD-TT-09 (4-12 WM)	WI MOD DRO	533207	WI MOD DRO	533600
10427642002	FD-TT-10 (2'-10' WM)	WI MOD DRO	533207	WI MOD DRO	533600
10427642003	FD-TT-11 (4-12 WM)	WI MOD DRO	533207	WI MOD DRO	533600
10427642004	FD-TT-12 (3-12)	WI MOD DRO	533207	WI MOD DRO	533600
10427642005	FD-TT-13 (3-12)	WI MOD DRO	533207	WI MOD DRO	533600
10427642001	FD-TT-09 (4-12 WM)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642002	FD-TT-10 (2'-10' WM)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642003	FD-TT-11 (4-12 WM)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642004	FD-TT-12 (3-12)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642005	FD-TT-13 (3-12)	EPA 5030 Medium Soil	534800	WI MOD GRO	534916
10427642001	FD-TT-09 (4-12 WM)	EPA 3050	533415	EPA 6010C	533499
10427642002	FD-TT-10 (2'-10' WM)	EPA 3050	533415	EPA 6010C	533499
10427642003	FD-TT-11 (4-12 WM)	EPA 3050	533415	EPA 6010C	533499
10427642004	FD-TT-12 (3-12)	EPA 3050	533415	EPA 6010C	533499
10427642005	FD-TT-13 (3-12)	EPA 3050	533415	EPA 6010C	533499
10427642001	FD-TT-09 (4-12 WM)	EPA 3050B	438855	EPA 6020	439080
10427642002	FD-TT-10 (2'-10' WM)	EPA 3050B	438855	EPA 6020	439080
10427642003	FD-TT-11 (4-12 WM)	EPA 3050B	438855	EPA 6020	439080
10427642004	FD-TT-12 (3-12)	EPA 3050B	438855	EPA 6020	439080
10427642005	FD-TT-13 (3-12)	EPA 3050B	438855	EPA 6020	439080
10427642001	FD-TT-09 (4-12 WM)	EPA 3050	533412	EPA 6020A	533510
10427642002	FD-TT-10 (2'-10' WM)	EPA 3050	533412	EPA 6020A	533510
10427642003	FD-TT-11 (4-12 WM)	EPA 3050	533412	EPA 6020A	533510
10427642004	FD-TT-12 (3-12)	EPA 3050	533412	EPA 6020A	533510
10427642005	FD-TT-13 (3-12)	EPA 3050	533412	EPA 6020A	533510
10427642001	FD-TT-09 (4-12 WM)	EPA 7471	533419	EPA 7471	533655
10427642002	FD-TT-10 (2'-10' WM)	EPA 7471	533419	EPA 7471	533655
10427642003	FD-TT-11 (4-12 WM)	EPA 7471	533419	EPA 7471	533655
10427642004	FD-TT-12 (3-12)	EPA 7471	533419	EPA 7471	533655
10427642005	FD-TT-13 (3-12)	EPA 7471	533419	EPA 7471	533655

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427642001	FD-TT-09 (4-12 WM)	ASTM D2974	534034		
10427642002	FD-TT-10 (2'-10' WM)	ASTM D2974	534034		
10427642003	FD-TT-11 (4-12 WM)	ASTM D2974	534034		
10427642004	FD-TT-12 (3-12)	ASTM D2974	534034		
10427642005	FD-TT-13 (3-12)	ASTM D2974	534034		
10427642001	FD-TT-09 (4-12 WM)	EPA 3550	533315	EPA 8270D	533819
10427642002	FD-TT-10 (2'-10' WM)	EPA 3550	533315	EPA 8270D	533819
10427642003	FD-TT-11 (4-12 WM)	EPA 3550	533315	EPA 8270D	533819
10427642004	FD-TT-12 (3-12)	EPA 3550	533315	EPA 8270D	533819
10427642005	FD-TT-13 (3-12)	EPA 3550	533315	EPA 8270D	533819
10427642005	FD-TT-13 (3-12)	EPA 3550	533315	EPA 8270D	533819
10427642001	FD-TT-09 (4-12 WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642002	FD-TT-10 (2'-10' WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642003	FD-TT-11 (4-12 WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642004	FD-TT-12 (3-12)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642005	FD-TT-13 (3-12)	EPA 3550	533341	EPA 8270D by SIM	533540
10427642001	FD-TT-09 (4-12 WM)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642002	FD-TT-10 (2'-10' WM)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642003	FD-TT-11 (4-12 WM)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642004	FD-TT-12 (3-12)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642005	FD-TT-13 (3-12)	EPA 5035/5030B	534461	EPA 8260B	534737
10427642001	FD-TT-09 (4-12 WM)	EPA 3060A	438492	EPA 7196A	438766
10427642002	FD-TT-10 (2'-10' WM)	EPA 3060A	439469	EPA 7196A	439714
10427642003	FD-TT-11 (4-12 WM)	EPA 3060A	439469	EPA 7196A	439714
10427642004	FD-TT-12 (3-12)	EPA 3060A	439469	EPA 7196A	439714
10427642005	FD-TT-13 (3-12)	EPA 3060A	439469	EPA 7196A	439714
10427642001	FD-TT-09 (4-12 WM)	Trivalent Chromium Calculation	440098		
10427642002	FD-TT-10 (2'-10' WM)	Trivalent Chromium Calculation	440098		
10427642003	FD-TT-11 (4-12 WM)	Trivalent Chromium Calculation	440098		
10427642004	FD-TT-12 (3-12)	Trivalent Chromium Calculation	440098		
10427642005	FD-TT-13 (3-12)	Trivalent Chromium Calculation	440098		
10427642001	FD-TT-09 (4-12 WM)	EPA 9012A	286937	EPA 9012	286958
10427642002	FD-TT-10 (2'-10' WM)	EPA 9012A	286937	EPA 9012	286958
10427642003	FD-TT-11 (4-12 WM)	EPA 9012A	286937	EPA 9012	286958
10427642004	FD-TT-12 (3-12)	EPA 9012A	286937	EPA 9012	286958
10427642005	FD-TT-13 (3-12)	EPA 9012A	286937	EPA 9012	286958
10427642001	FD-TT-09 (4-12 WM)	EPA 300.0	141337	EPA 9056A	141349
10427642002	FD-TT-10 (2'-10' WM)	EPA 300.0	141337	EPA 9056A	141349
10427642003	FD-TT-11 (4-12 WM)	EPA 300.0	141337	EPA 9056A	141349
10427642004	FD-TT-12 (3-12)	EPA 300.0	141337	EPA 9056A	141349
10427642005	FD-TT-13 (3-12)	EPA 300.0	141337	EPA 9056A	141349

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427642

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
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REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

WO# 10427642



Chain-of-Custody Form

Work Order Number:

Turnaround Time:

10427642

of
LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MPCA-Freeway LF solids
 Project Name: MPCA-Freeway LF solids
 Project Manager:
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name:
 Address: 18-00383
EPIC Profile #38716
 Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 S=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Ww-Ground=Groundwater
 Ws-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	Lab Sample No.	#	
FD-TT-09	S	4/17/18	9:20	4'	12'	C	SD	WM			13	X	X								001	1
FD-TT-10	S	4/17/18	12:15	2'	10'	C	SD	WM			13	X	X								002	2
FD-TT-11	S	4/17/18	13:24	4'	12'	C	SD	WM			13	X	X								003	3
FD-TT-12	S	4/17/18	14:37	3'	12'	C	SD	WM			13	X	X								004	4
FD-TT-B(3-12)	S	4/17/18	15:33	3'	12'	C	SD	WM			13	X	X								005	5
																						6
																						7
																						8
																						9
																						10

see attached for soils/waste (-Dioxins) + Dioxins

Sampled By:

Sampler's Signature:

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
Noty Richard / Pace	4/17/18 1730	MCA Pace	4/17/18 1730

1730
T=9.6

Sample Condition Upon Receipt

Client Name: mn Pollution Control Project #: WO# : 10427642

WO# : 10427642
 PM: JMA Due Date: 05/02/18
 CLIENT: ASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No *4/17/18*

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 9.4 Cooler Temp Corrected (°C): 9.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ET 4/17/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <i>4/17/18</i> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2. No "list" included
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. <i>4/17/18</i>
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/19/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO#: 12107383
 PM: HRZ Due Date: 05/02/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.1 Cooler Temp Corrected °C: 5.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 4-20-18 DC

Comments: BM 4/20/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SK</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____


FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Cavin Fern Date: 4/20/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: Pace MN

WO# : 40167733



40167733

Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Tracking #: 1697357

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 66 Type of Ice: Wet Blue Dry None

Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 3 / Corr: 3.5

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:
Date: 4/20/18
Initials: RS

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRWU RS 4/20/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>NO collect times on client labels</u>
-Includes date/time/ID/Analysis Matrix: <u>S</u>		<u>RS 4/20/18</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments
Person Contacted: _____ Date/Time: _____
Comments/ Resolution: _____

Project Manager Review: CKV

Date: 4/20/18

Sample Condition Upon Receipt

Client Name: PACE MPLS **Project #:** _____

WO#: 12107383

PM: HRZ Due Date: 05/04/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer Used: 01339252/1710 IR-1 **Type of Ice:** Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 4.0 **Cooler Temp Corrected °C:** 4.0 **Biological Tissue Frozen?** Yes No NA

Temp should be above freezing to 6°C **Correction Factor:** 0.0 **Date and Initials of Person Examining Contents:** 4/20/18

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ **Date/Time:** _____

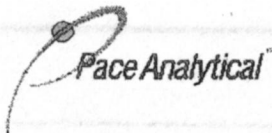
Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ **Date:** _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194903

Date/Time and Initials of person examining contents: JH 4-20-18 954

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2530

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 123456ABCDEF Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2.2/2.5 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		X	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl. All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			X
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X				
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: Analysis:		X	Headspace Wisconsin Sulfide			X
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):			X
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		X	

Comments:

Sample Container Count

CLIENT: Pace MN

WO#: 50194903

 50194903

COC PAGE ___ of ___

COC ID# _____

Project # 50194903

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix S (Soil/Wa Aqueous)	pH <2	pH >9	pH >1
1																			Sc			
2																			Sc			
3																			Sc			
4																			Sc			
5																			St			
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 28, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/20/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427642
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-09 (4-12 WM) (10427642001)	A181623-01	Solid	04/17/2018	04/20/2018
FD-TT-10 (2'-10' WM) (10427642002)	A181623-02	Solid	04/17/2018	04/20/2018
FD-TT-11 (4-12 WM) (10427642003)	A181623-03	Solid	04/17/2018	04/20/2018
FD-TT-12 (3-12) (10427642004)	A181623-04	Solid	04/17/2018	04/20/2018
FD-TT-13 (3-12) (10427642005)	A181623-05	Solid	04/17/2018	04/20/2018

CASE NARRATIVE

Sample Receipt Information:

5 samples were received on 04/20/2018. Samples were received at 2.3 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LC footnote on sample A181623-05 states that there was a low CCV recovery for bentazon. The lower control limit is 85% and the lowest recovery was 83.2%.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427642 Project Manager: Jennifer Anderson
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FD-TT-10 (2'-10' WM) (10427642002)

A181623-02 (Solid)

Date Sampled
04/17/2018 12:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:48	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 09:10	EPA 8321B	

Surrogate: DCAA 84.3 % 70.8-116 04/22/2018 04/23/2018 09:10 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	79.1	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

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 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427642
 Project Manager: Jennifer Anderson

FD-TT-11 (4-12 WM) (10427642003)

A181623-03 (Solid)

Date Sampled
04/17/2018 13:24

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:54	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:54	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 10:17	EPA 8321B	
Surrogate: DCAA		87.6 %		70.8-116	04/22/2018	04/23/2018 10:17	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	78.3	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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FD-TT-12 (3-12) (10427642004)
A181623-04 (Solid)

Date Sampled
 04/17/2018 14:37

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	0.13	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:00	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 12:00	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 11:24	EPA 8321B	

Surrogate: DCAA 87.5 % 70.8-116 04/22/2018 04/23/2018 11:24 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	72.4	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427642
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

Blank (A804178-BLK1)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 20:52										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
<i>Surrogate: DCAA</i>	<i>19.9</i>		<i>mg/kg wet</i>	<i>20.00</i>		<i>99.7</i>	<i>70.8-116</i>			
<i>Surrogate: DCAA [2C]</i>	<i>17.9</i>		<i>mg/kg wet</i>	<i>20.00</i>		<i>89.4</i>	<i>62.3-114</i>			

LCS (A804178-BS1)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 19:45										
2,4-D	1.89	0.10	mg/kg wet	2.000		94.5	81.6-107			
2,4-D [2C]	1.73	0.10	mg/kg wet	2.000		86.5	71.8-120			
2,4-DB	1.77	0.10	mg/kg wet	2.000		88.7	76.4-107			
2,4-DB [2C]	1.66	0.10	mg/kg wet	2.000		82.9	62.2-129			
2,4,5-T	1.96	0.10	mg/kg wet	2.000		98.0	81.2-110			
2,4,5-T [2C]	1.87	0.10	mg/kg wet	2.000		93.6	70.6-125			
2,4,5-TP	1.86	0.10	mg/kg wet	2.000		92.8	79.1-106			
2,4,5-TP [2C]	1.74	0.10	mg/kg wet	2.000		86.9	68.2-118			
Bentazon	1.02	0.10	mg/kg wet	1.000		102	82.5-119			
Bentazon [2C]	0.877	0.10	mg/kg wet	1.000		87.7	73.3-125			
Dicamba	1.93	0.10	mg/kg wet	2.000		96.3	85.1-108			
Dicamba [2C]	1.83	0.10	mg/kg wet	2.000		91.4	71.4-115			
Picloram	0.978	0.10	mg/kg wet	1.000		97.8	86.1-106			
Picloram [2C]	0.846	0.10	mg/kg wet	1.000		84.6	74.5-114			
Triclopyr	1.86	0.10	mg/kg wet	2.000		92.9	78.6-106			
Triclopyr [2C]	1.71	0.10	mg/kg wet	2.000		85.6	69.4-118			
<i>Surrogate: DCAA</i>	<i>19.8</i>		<i>mg/kg wet</i>	<i>20.00</i>		<i>98.9</i>	<i>70.8-116</i>			
<i>Surrogate: DCAA [2C]</i>	<i>18.3</i>		<i>mg/kg wet</i>	<i>20.00</i>		<i>91.7</i>	<i>62.3-114</i>			

LCS (A804178-BS2)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 18:37										
MCPA	2.14	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	1.92	0.10	mg/kg wet	2.000		95.9	77-123			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427642
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

LCS (A804178-BS2)

Prepared: 04/22/2018 Analyzed: 04/22/2018 18:37

Surrogate: DCAA	19.9		mg/kg wet	20.00		99.4	70.8-116			
Surrogate: DCAA [2C]	20.2		mg/kg wet	20.00		101	62.3-114			

Matrix Spike (A804178-MS1)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/22/2018 23:06

2,4-D	2.05	0.10	mg/kg dry	2.490	ND	82.5	71.4-105			
2,4-D [2C]	1.94	0.10	mg/kg dry	2.490	0.220	69.1	50.5-123			
2,4-DB	1.91	0.10	mg/kg dry	2.490	0.0501	74.6	46.4-117			
2,4-DB [2C]	1.76	0.10	mg/kg dry	2.490	0.252	60.6	44.5-121			
2,4,5-T	2.16	0.10	mg/kg dry	2.490	ND	86.8	66.2-110			
2,4,5-T [2C]	1.87	0.10	mg/kg dry	2.490	ND	75.2	43.6-126			
2,4,5-TP	2.01	0.10	mg/kg dry	2.490	0.199	72.7	52.4-114			
2,4,5-TP [2C]	1.61	0.10	mg/kg dry	2.490	0.219	55.8	47.6-117			
Bentazon	1.13	0.10	mg/kg dry	1.245	ND	91.0	61.5-117			
Bentazon [2C]	1.20	0.10	mg/kg dry	1.245	ND	96.2	50.7-127			
Dicamba	1.71	0.10	mg/kg dry	2.490	ND	68.7	48.4-111			
Dicamba [2C]	1.86	0.10	mg/kg dry	2.490	0.290	63.1	43.3-108			
Picloram	0.654	0.10	mg/kg dry	1.245	ND	52.6	26.7-110			
Picloram [2C]	0.505	0.10	mg/kg dry	1.245	ND	40.6	10.8-110			
Triclopyr	2.16	0.10	mg/kg dry	2.490	0.182	79.6	56-113			
Triclopyr [2C]	1.70	0.10	mg/kg dry	2.490	0.211	60.0	47.9-120			
Surrogate: DCAA	21.6		mg/kg dry	24.89		86.8	70.8-116			
Surrogate: DCAA [2C]	20.6		mg/kg dry	24.89		82.8	62.3-114			

Matrix Spike (A804178-MS2)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/23/2018 01:20

MCPA	2.29	0.10	mg/kg dry	2.490	ND	92.0	74.2-114			
MCPA [2C]	2.16	0.10	mg/kg dry	2.490	ND	86.7	60.9-122			
Surrogate: DCAA	21.5		mg/kg dry	24.89		86.2	70.8-116			
Surrogate: DCAA [2C]	22.0		mg/kg dry	24.89		88.3	62.3-114			

Matrix Spike Dup (A804178-MSD1)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/23/2018 00:13

2,4-D	2.10	0.10	mg/kg dry	2.490	ND	84.3	71.4-105	2.19	20	
2,4-D [2C]	2.24	0.10	mg/kg dry	2.490	0.220	81.2	50.5-123	14.4	20	
2,4-DB	1.94	0.10	mg/kg dry	2.490	0.0501	76.1	46.4-117	1.91	20	
2,4-DB [2C]	1.82	0.10	mg/kg dry	2.490	0.252	63.2	44.5-121	3.63	20	
2,4,5-T	2.13	0.10	mg/kg dry	2.490	ND	85.4	66.2-110	1.61	20	
2,4,5-T [2C]	1.69	0.10	mg/kg dry	2.490	ND	67.7	43.6-126	10.5	20	
2,4,5-TP	1.97	0.10	mg/kg dry	2.490	0.199	71.0	52.4-114	2.17	20	
2,4,5-TP [2C]	1.69	0.10	mg/kg dry	2.490	0.219	59.2	47.6-117	5.02	20	
Bentazon	1.13	0.10	mg/kg dry	1.245	ND	90.5	61.5-117	0.559	20	
Bentazon [2C]	1.21	0.10	mg/kg dry	1.245	ND	96.9	50.7-127	0.794	20	
Dicamba	1.70	0.10	mg/kg dry	2.490	ND	68.5	48.4-111	0.297	20	
Dicamba [2C]	2.04	0.10	mg/kg dry	2.490	0.290	70.2	43.3-108	9.07	20	
Picloram	0.591	0.10	mg/kg dry	1.245	ND	47.5	26.7-110	10.2	20	
Picloram [2C]	0.569	0.10	mg/kg dry	1.245	ND	45.7	10.8-110	11.8	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427642 Project Manager: Jennifer Anderson
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Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

Matrix Spike Dup (A804178-MSD1)		Source: A181624-02			Prepared: 04/22/2018 Analyzed: 04/23/2018 00:13					
Triclopyr	2.16	0.10	mg/kg dry	2.490	0.182	79.6	56-113	0.0287	20	
Triclopyr [2C]	2.10	0.10	mg/kg dry	2.490	0.211	76.0	47.9-120	20.9	20	X
Surrogate: DCAA	21.7		mg/kg dry	24.89		87.1	70.8-116			
Surrogate: DCAA [2C]	20.6		mg/kg dry	24.89		82.8	62.3-114			
Matrix Spike Dup (A804178-MSD2)		Source: A181624-02			Prepared: 04/22/2018 Analyzed: 04/23/2018 02:27					
MCPA	2.35	0.10	mg/kg dry	2.490	ND	94.2	74.2-114	2.42	20	
MCPA [2C]	2.47	0.10	mg/kg dry	2.490	ND	99.2	60.9-122	13.5	20	
Surrogate: DCAA	21.5		mg/kg dry	24.89		86.3	70.8-116			
Surrogate: DCAA [2C]	23.4		mg/kg dry	24.89		94.0	62.3-114			



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 608.221.4889 Fax

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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804195 - % Solids

Duplicate (A804195-DUP1)	Source: A181708-01		Prepared: 04/25/2018 Analyzed: 04/27/2018 09:07							
% Solids	79.2	0.00	% by Weight		79.6			0.516	20	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427642
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- P The difference in the concentrations between the primary and confirmation column was > 40%.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

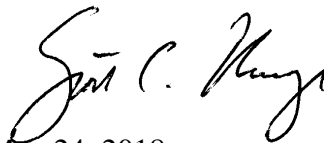
PaceProject#: 10427823
Sample Receipt Date: 04/18/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: N/A

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 24, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

May 24, 2018



DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 50-67%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. In cases where the estimated detection limits (EDLs) were above the standard reporting limits, the EDLs were reported and flagged "A".

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 116%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New Hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10427823

Appendix A

Sample Management

Sample Condition Upon Receipt

Client Name:
MPCA

Project #:

WOT 10427823

PM: SCU Due Date: 05/03/18
CLIENT: EAST-MNPLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 7.1 Cooler Temp Corrected (°C): 7.3 Biological Tissue Frozen? Yes No N/A
Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: M.D. 9/18/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No times on samples</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
Comments/Resolution: _____

Project Manager Review: *[Signature]* Date: 04/19/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Litium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427823

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-14 (2' -12' WM)		
Lab Sample ID	10427823001		
Filename	Y180511A_06		
Injected By	SMT		
Total Amount Extracted	13.5 g	Matrix	Solid
% Moisture	24.2	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	04/18/2018 09:10
ICAL ID	Y180204	Received	04/18/2018 17:30
CCal Filename(s)	Y180510C_16 & Y180511A_17	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/11/2018 06:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.9 A	2,3,7,8-TCDD-13C	2.00	67
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	120

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-01 (3'-11' WM)		
Lab Sample ID	10427823002		
Filename	U180505A_06		
Injected By	BAL		
Total Amount Extracted	13.6 g	Matrix	Solid
% Moisture	17.9	Dilution	NA
Dry Weight Extracted	11.2 g	Collected	04/18/2018 12:30
ICAL ID	U180405	Received	04/18/2018 17:30
CCal Filename(s)	U180504B_15 & U180505A_10	Extracted	04/24/2018 14:55
Method Blank ID	BLANK-61921	Analyzed	05/05/2018 09:52

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	2.9 A	2,3,7,8-TCDD-13C	2.00	50
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	54

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

A = Reporting Limit based on signal to noise
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61921	Matrix	Solid
Filename	Y180511A_04	Dilution	NA
Total Amount Extracted	10.1 g	Extracted	04/24/2018 14:55
ICAL ID	Y180204	Analyzed	05/11/2018 04:51
CCal Filename(s)	Y180510C_16 & Y180511A_17	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	58

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61922	Matrix	Solid
Filename	Y180511A_01	Dilution	NA
Total Amount Extracted	10.0 g	Extracted	04/24/2018 14:55
ICAL ID	Y180204	Analyzed	05/11/2018 02:41
CCal Filename(s)	Y180510C_16 & Y180511A_17	Injected By	SMT
Method Blank ID	BLANK-61921		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.23	116	2,3,7,8-TCDD-13C	2.0	66
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	69

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 03, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 18, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137
 Mississippi Certification #: MN00064
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon NwTPH Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DW Certification #: 9952 C
 West Virginia DEP Certification #: 382
 Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 Montana Certificate #CERT0103
 California Certification #2973
 California Certification #2973
 Alaska Certification UST-107
 Alaska Certification #MN01084
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
 North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007
 Nevada DNR #MN010842018-1
 Oklahoma Department of Environmental Quality
 California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
 Montana DHHS Certification #: CERT0102
 Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
 Wisconsin DNR Certification #: 999446800
 North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
 Florida/NELAP Certification #: E87948
 Illinois Certification #: 200050
 Kentucky UST Certification #: 82
 Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
 New York Certification #: 12064
 North Dakota Certification #: R-150
 Virginia VELAP ID: 460263
 South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427824001	FD-TT-14 (2' -12' WM)	Solid	04/18/18 09:10	04/18/18 17:30
10427824002	FL-TT-01 (3'-11' WM)	Solid	04/18/18 12:30	04/18/18 17:30
10427824003	FL-TT-02 (2'-10.5' WM)	Solid	04/18/18 13:50	04/18/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10427824001	FD-TT-14 (2' -12' WM)	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	RJS	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	GDM	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10427824002	FL-TT-01 (3'-11' WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
EPA 8082A	RAG			12	PASI-M		
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	RJS			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2, GDM			72	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10427824003	FL-TT-02 (2'-10.5' WM)			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	RJS	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	GDM	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: **FD-TT-14 (2' -12' WM)** Lab ID: **10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.4	1	04/25/18 10:56	04/30/18 15:19	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	309-00-2	M6
alpha-BHC	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	319-84-6	M6
beta-BHC	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	319-85-7	M6
delta-BHC	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	58-89-9	M6
Chlordane (Technical)	ND	ug/kg	2200	100	04/19/18 13:04	04/26/18 21:09	57-74-9	
alpha-Chlordane	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	5103-71-9	M6
gamma-Chlordane	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	5103-74-2	M6
4,4'-DDD	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	72-54-8	M6
4,4'-DDE	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	72-55-9	
4,4'-DDT	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	50-29-3	M6
Dieldrin	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	60-57-1	M6
Endosulfan I	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	959-98-8	
Endosulfan II	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	33213-65-9	
Endosulfan sulfate	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	1031-07-8	
Endrin	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	72-20-8	
Endrin aldehyde	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	7421-93-4	
Endrin ketone	ND	ug/kg	439	100	04/19/18 13:04	04/26/18 21:09	53494-70-5	M6
Heptachlor	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	76-44-8	M6
Heptachlor epoxide	ND	ug/kg	220	100	04/19/18 13:04	04/26/18 21:09	1024-57-3	
Methoxychlor	ND	ug/kg	2200	100	04/19/18 13:04	04/26/18 21:09	72-43-5	
Toxaphene	ND	ug/kg	6590	100	04/19/18 13:04	04/26/18 21:09	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	100	04/19/18 13:04	04/26/18 21:09	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	100	04/19/18 13:04	04/26/18 21:09	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11141-16-5	
PCB-1242 (Aroclor 1242)	2750	ug/kg	218	5	04/19/18 13:39	04/24/18 10:26	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	12672-29-6	
PCB-1254 (Aroclor 1254)	546	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	43.5	1	04/19/18 13:39	04/23/18 18:52	11100-14-4	
PCB, Total	3290	ug/kg	218	5	04/19/18 13:39	04/24/18 10:26	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	101	%.	48-125	1	04/19/18 13:39	04/23/18 18:52	877-09-8	
Decachlorobiphenyl (S)	97	%.	30-134	1	04/19/18 13:39	04/23/18 18:52	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID: 10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	1420	mg/kg	875	20	04/20/18 17:57	04/22/18 13:07		T6
Surrogates								
n-Triacontane (S)	0	%.	50-150	20	04/20/18 17:57	04/22/18 13:07	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	98.5	mg/kg	14.8	1	05/02/18 10:19	05/02/18 14:31		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	05/02/18 10:19	05/02/18 14:31	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	7110	mg/kg	12.9	1	04/20/18 05:22	04/23/18 11:48	7429-90-5	
Barium	153	mg/kg	0.65	1	04/20/18 05:22	04/23/18 11:48	7440-39-3	
Boron	99.2	mg/kg	9.7	1	04/20/18 05:22	04/23/18 11:48	7440-42-8	
Copper	78.8	mg/kg	0.65	1	04/20/18 05:22	04/23/18 11:48	7440-50-8	
Iron	31700	mg/kg	16.2	5	04/20/18 05:22	04/23/18 12:58	7439-89-6	
Manganese	408	mg/kg	0.32	1	04/20/18 05:22	04/23/18 11:48	7439-96-5	
Nickel	66.4	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:48	7440-02-0	
Silver	ND	mg/kg	0.65	1	04/20/18 05:22	04/23/18 11:48	7440-22-4	
Tin	10.9	mg/kg	4.9	1	04/20/18 05:22	04/23/18 11:48	7440-31-5	
Titanium	263	mg/kg	1.6	1	04/20/18 05:22	04/23/18 11:48	7440-32-6	
Zinc	205	mg/kg	1.3	1	04/20/18 05:22	04/23/18 11:48	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	10	mg/kg	0.25	1	04/25/18 09:25	04/26/18 03:37	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.3	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7440-36-0	
Arsenic	12.7	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7440-38-2	
Beryllium	1.4	mg/kg	0.26	20	04/20/18 06:41	04/21/18 05:03	7440-41-7	
Cadmium	2.2	mg/kg	0.10	20	04/20/18 06:41	04/21/18 05:03	7440-43-9	
Cobalt	8.9	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7440-48-4	
Lead	137	mg/kg	0.13	20	04/20/18 06:41	04/21/18 05:03	7439-92-1	
Lithium	7.9	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7439-93-2	
Selenium	2.8	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7782-49-2	
Strontium	70.2	mg/kg	0.65	20	04/20/18 06:41	04/21/18 05:03	7440-24-6	
Vanadium	63.1	mg/kg	1.3	20	04/20/18 06:41	04/21/18 05:03	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.27	mg/kg	0.023	1	04/20/18 04:53	04/22/18 16:33	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	24.2	%	0.10	1		04/24/18 13:49		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	83-32-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: **FD-TT-14 (2' -12' WM)** Lab ID: **10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	208-96-8	
Anthracene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	120-12-7	
Benzo(a)anthracene	19200	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	56-55-3	
Benzo(a)pyrene	13400	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	50-32-8	
Benzo(b)fluoranthene	13900	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	101-55-3	
Butylbenzylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	85-68-7	
Carbazole	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	59-50-7	
4-Chloroaniline	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	108-60-1	
2-Chloronaphthalene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	91-58-7	
2-Chlorophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	7005-72-3	
Chrysene	19100	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	53-70-3	
Dibenzofuran	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	120-83-2	
Diethylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	105-67-9	
Dimethylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	131-11-3	
Di-n-butylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	56000	5	04/19/18 19:31	04/26/18 00:28	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	606-20-2	
Di-n-octylphthalate	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	122-66-7	
bis(2-Ethylhexyl)phthalate	18400	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	117-81-7	
Fluoranthene	31300	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	206-44-0	
Fluorene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	87-68-3	
Hexachlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	118-74-1	
Hexachloroethane	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	193-39-5	
Isophorone	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	78-59-1	
1-Methylnaphthalene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	90-12-0	
2-Methylnaphthalene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID: 10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	21700	5	04/19/18 19:31	04/26/18 00:28		
Naphthalene	12200	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	91-20-3	
2-Nitroaniline	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	88-74-4	
3-Nitroaniline	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	99-09-2	
4-Nitroaniline	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	100-01-6	
Nitrobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	98-95-3	
2-Nitrophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	88-75-5	
4-Nitrophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	86-30-6	
Pentachlorophenol	ND	ug/kg	22100	5	04/19/18 19:31	04/26/18 00:28	87-86-5	
Phenanthrene	36800	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	85-01-8	
Phenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	108-95-2	
Pyrene	44500	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	10900	5	04/19/18 19:31	04/26/18 00:28	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	43-125	5	04/19/18 19:31	04/26/18 00:28	4165-60-0	D3,P3, S4
2-Fluorobiphenyl (S)	0	%	30-132	5	04/19/18 19:31	04/26/18 00:28	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	62-125	5	04/19/18 19:31	04/26/18 00:28	1718-51-0	S4
Phenol-d6 (S)	0	%	48-125	5	04/19/18 19:31	04/26/18 00:28	13127-88-3	S4
2-Fluorophenol (S)	0	%	40-125	5	04/19/18 19:31	04/26/18 00:28	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	60-125	5	04/19/18 19:31	04/26/18 00:28	118-79-6	S4
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	39700	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	83-32-9	
Acenaphthylene	390	ug/kg	65.9	5	04/19/18 18:12	04/20/18 18:30	208-96-8	
Anthracene	30700	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	120-12-7	
Benzo(a)anthracene	30500	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	56-55-3	
Benzo(a)pyrene	25600	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	50-32-8	
Benzo(b)fluoranthene	32200	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	205-99-2	
Benzo(g,h,i)perylene	12800	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	191-24-2	
Benzo(k)fluoranthene	11200	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	207-08-9	
Chrysene	23700	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	218-01-9	
Dibenz(a,h)anthracene	3390	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	53-70-3	
Fluoranthene	79500	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	206-44-0	
Fluorene	37300	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	86-73-7	
Indeno(1,2,3-cd)pyrene	11300	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	193-39-5	
Naphthalene	14700	ug/kg	659	50	04/19/18 18:12	04/23/18 20:09	91-20-3	
Phenanthrene	104000	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	85-01-8	
Pyrene	60300	ug/kg	3300	250	04/19/18 18:12	04/23/18 20:30	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID: 10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
2-Fluorobiphenyl (S)	52	%.	42-125	5	04/19/18 18:12	04/20/18 18:30	321-60-8	D3
p-Terphenyl-d14 (S)	93	%.	57-125	5	04/19/18 18:12	04/20/18 18:30	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1320	1	04/29/18 13:40	04/29/18 22:34	67-64-1	
Allyl chloride	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	107-05-1	L2
Benzene	ND	ug/kg	26.4	1	04/29/18 13:40	04/29/18 22:34	71-43-2	
Bromobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	108-86-1	
Bromochloromethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	74-97-5	
Bromodichloromethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	75-27-4	
Bromoform	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	75-25-2	
Bromomethane	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	74-83-9	
2-Butanone (MEK)	ND	ug/kg	330	1	04/29/18 13:40	04/29/18 22:34	78-93-3	
n-Butylbenzene	542	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	104-51-8	
sec-Butylbenzene	343	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	135-98-8	
tert-Butylbenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	98-06-6	
Carbon tetrachloride	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	56-23-5	
Chlorobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	108-90-7	
Chloroethane	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	75-00-3	
Chloroform	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	67-66-3	
Chloromethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	74-87-3	
2-Chlorotoluene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	95-49-8	
4-Chlorotoluene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	96-12-8	
Dibromochloromethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	106-93-4	
Dibromomethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	74-95-3	
1,2-Dichlorobenzene	169	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	541-73-1	
1,4-Dichlorobenzene	194	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	75-71-8	
1,1-Dichloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	75-34-3	
1,2-Dichloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	107-06-2	
1,1-Dichloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	156-60-5	
Dichlorofluoromethane	ND	ug/kg	659	1	04/29/18 13:40	04/29/18 22:34	75-43-4	
1,2-Dichloropropane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	78-87-5	
1,3-Dichloropropane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	142-28-9	
2,2-Dichloropropane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	594-20-7	
1,1-Dichloropropene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	60-29-7	
Ethylbenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	100-41-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FD-TT-14 (2' -12' WM) **Lab ID: 10427824001** Collected: 04/18/18 09:10 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Hexachloro-1,3-butadiene	ND	ug/kg	330	1	04/29/18 13:40	04/29/18 22:34	87-68-3	
Isopropylbenzene (Cumene)	243	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	98-82-8	
p-Isopropyltoluene	70.5	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	99-87-6	
Methylene Chloride	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	330	1	04/29/18 13:40	04/29/18 22:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	1634-04-4	
Naphthalene	6210	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	91-20-3	
n-Propylbenzene	468	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	103-65-1	
Styrene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	79-34-5	
Tetrachloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	127-18-4	
Tetrahydrofuran	ND	ug/kg	2640	1	04/29/18 13:40	04/29/18 22:34	109-99-9	
Toluene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	79-00-5	
Trichloroethene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	79-01-6	
Trichlorofluoromethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	264	1	04/29/18 13:40	04/29/18 22:34	76-13-1	
1,2,4-Trimethylbenzene	471	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	65.9	1	04/29/18 13:40	04/29/18 22:34	108-67-8	
Vinyl chloride	ND	ug/kg	26.4	1	04/29/18 13:40	04/29/18 22:34	75-01-4	
Xylene (Total)	ND	ug/kg	198	1	04/29/18 13:40	04/29/18 22:34	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%	75-125	1	04/29/18 13:40	04/29/18 22:34	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	04/29/18 13:40	04/29/18 22:34	2037-26-5	
4-Bromofluorobenzene (S)	107	%	75-125	1	04/29/18 13:40	04/29/18 22:34	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	25.7	10	04/28/18 10:35	05/01/18 10:57	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	10.0	mg/kg	1.0	1		05/03/18 07:26	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.62	mg/kg	0.53	1	04/25/18 11:00	04/25/18 13:40	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/25/18 14:45	04/26/18 03:08	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.6	1	04/25/18 10:56	04/30/18 15:26	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	309-00-2	
alpha-BHC	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	319-84-6	
beta-BHC	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	319-85-7	
delta-BHC	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	58-89-9	
Chlordane (Technical)	ND	ug/kg	1010	50	04/19/18 13:04	04/27/18 00:30	57-74-9	
alpha-Chlordane	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	5103-71-9	
gamma-Chlordane	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	5103-74-2	
4,4'-DDD	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	72-54-8	
4,4'-DDE	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	72-55-9	
4,4'-DDT	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	50-29-3	
Dieldrin	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	60-57-1	
Endosulfan I	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	959-98-8	
Endosulfan II	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	33213-65-9	
Endosulfan sulfate	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	1031-07-8	
Endrin	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	72-20-8	
Endrin aldehyde	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	7421-93-4	
Endrin ketone	ND	ug/kg	202	50	04/19/18 13:04	04/27/18 00:30	53494-70-5	
Heptachlor	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	76-44-8	
Heptachlor epoxide	ND	ug/kg	101	50	04/19/18 13:04	04/27/18 00:30	1024-57-3	
Methoxychlor	ND	ug/kg	1010	50	04/19/18 13:04	04/27/18 00:30	72-43-5	
Toxaphene	ND	ug/kg	3040	50	04/19/18 13:04	04/27/18 00:30	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	30-150	50	04/19/18 13:04	04/27/18 00:30	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-150	50	04/19/18 13:04	04/27/18 00:30	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	12672-29-6	
PCB-1254 (Aroclor 1254)	125	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	11100-14-4	
PCB, Total	125	ug/kg	40.1	1	04/19/18 13:39	04/23/18 19:40	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	68	%.	48-125	1	04/19/18 13:39	04/23/18 19:40	877-09-8	
Decachlorobiphenyl (S)	126	%.	30-134	1	04/19/18 13:39	04/23/18 19:40	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	889	mg/kg	536	10	04/20/18 17:57	04/22/18 14:19		T6
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/20/18 17:57	04/22/18 14:19	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	13.1	1	05/02/18 10:19	05/02/18 12:53		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	05/02/18 10:19	05/02/18 12:53	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	4360	mg/kg	11.5	1	04/20/18 05:22	04/23/18 11:51	7429-90-5	
Barium	636	mg/kg	0.57	1	04/20/18 05:22	04/23/18 11:51	7440-39-3	
Boron	9.0	mg/kg	8.6	1	04/20/18 05:22	04/23/18 11:51	7440-42-8	
Copper	20.7	mg/kg	0.57	1	04/20/18 05:22	04/23/18 11:51	7440-50-8	
Iron	9410	mg/kg	2.9	1	04/20/18 05:22	04/23/18 11:51	7439-89-6	
Manganese	402	mg/kg	0.29	1	04/20/18 05:22	04/23/18 11:51	7439-96-5	
Nickel	10.9	mg/kg	1.1	1	04/20/18 05:22	04/23/18 11:51	7440-02-0	
Silver	ND	mg/kg	0.57	1	04/20/18 05:22	04/23/18 11:51	7440-22-4	
Tin	8.6	mg/kg	4.3	1	04/20/18 05:22	04/23/18 11:51	7440-31-5	
Titanium	196	mg/kg	1.4	1	04/20/18 05:22	04/23/18 11:51	7440-32-6	
Zinc	412	mg/kg	1.1	1	04/20/18 05:22	04/23/18 11:51	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	4.0	mg/kg	0.22	1	04/25/18 09:25	04/26/18 04:06	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7440-36-0	
Arsenic	5.4	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7440-38-2	
Beryllium	0.34	mg/kg	0.23	20	04/20/18 06:41	04/21/18 05:07	7440-41-7	
Cadmium	0.61	mg/kg	0.093	20	04/20/18 06:41	04/21/18 05:07	7440-43-9	
Cobalt	8.0	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7440-48-4	
Lead	275	mg/kg	0.12	20	04/20/18 06:41	04/21/18 05:07	7439-92-1	
Lithium	5.3	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7439-93-2	
Selenium	0.89	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7782-49-2	
Strontium	44.3	mg/kg	0.58	20	04/20/18 06:41	04/21/18 05:07	7440-24-6	
Vanadium	24.8	mg/kg	1.2	20	04/20/18 06:41	04/21/18 05:07	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.38	mg/kg	0.021	1	04/20/18 04:53	04/22/18 16:35	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	17.9	%	0.10	1		04/24/18 13:49		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	2310	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	83-32-9	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthylene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	208-96-8	
Anthracene	5340	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	120-12-7	
Benzo(a)anthracene	14800	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	56-55-3	
Benzo(a)pyrene	13200	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	50-32-8	
Benzo(b)fluoranthene	17100	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	205-99-2	
Benzo(g,h,i)perylene	9010	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	191-24-2	
Benzo(k)fluoranthene	6680	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	85-68-7	
Carbazole	2920	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	59-50-7	
4-Chloroaniline	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	108-60-1	
2-Chloronaphthalene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	91-58-7	
2-Chlorophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	7005-72-3	
Chrysene	15000	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	53-70-3	
Dibenzofuran	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	120-83-2	
Diethylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	105-67-9	
Dimethylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	131-11-3	
Di-n-butylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	10300	5	04/19/18 19:31	04/26/18 00:56	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	117-81-7	
Fluoranthene	29100	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	206-44-0	
Fluorene	2660	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	87-68-3	
Hexachlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	118-74-1	
Hexachloroethane	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	67-72-1	
Indeno(1,2,3-cd)pyrene	7810	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	193-39-5	
Isophorone	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	78-59-1	
1-Methylnaphthalene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

2-Methylphenol(o-Cresol)	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	4010	5	04/19/18 19:31	04/26/18 00:56		
Naphthalene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	91-20-3	
2-Nitroaniline	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	88-74-4	
3-Nitroaniline	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	99-09-2	
4-Nitroaniline	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	100-01-6	
Nitrobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	98-95-3	
2-Nitrophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	88-75-5	
4-Nitrophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	86-30-6	
Pentachlorophenol	ND	ug/kg	4070	5	04/19/18 19:31	04/26/18 00:56	87-86-5	
Phenanthrene	20000	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	85-01-8	
Phenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	108-95-2	
Pyrene	27800	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2000	5	04/19/18 19:31	04/26/18 00:56	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	51	%	43-125	5	04/19/18 19:31	04/26/18 00:56	4165-60-0	D3
2-Fluorobiphenyl (S)	56	%	30-132	5	04/19/18 19:31	04/26/18 00:56	321-60-8	
p-Terphenyl-d14 (S)	73	%	62-125	5	04/19/18 19:31	04/26/18 00:56	1718-51-0	
Phenol-d6 (S)	55	%	48-125	5	04/19/18 19:31	04/26/18 00:56	13127-88-3	
2-Fluorophenol (S)	54	%	40-125	5	04/19/18 19:31	04/26/18 00:56	367-12-4	
2,4,6-Tribromophenol (S)	54	%	60-125	5	04/19/18 19:31	04/26/18 00:56	118-79-6	S5

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	1740	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	83-32-9	
Acenaphthylene	308	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	208-96-8	
Anthracene	3890	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	120-12-7	
Benzo(a)anthracene	11100	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	56-55-3	
Benzo(a)pyrene	10700	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	50-32-8	
Benzo(b)fluoranthene	14600	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	205-99-2	
Benzo(g,h,i)perylene	6720	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	191-24-2	
Benzo(k)fluoranthene	4760	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	207-08-9	
Chrysene	10000	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	218-01-9	
Dibenz(a,h)anthracene	1630	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	53-70-3	
Fluoranthene	23800	ug/kg	1210	100	04/19/18 18:12	04/24/18 13:32	206-44-0	
Fluorene	1910	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	86-73-7	
Indeno(1,2,3-cd)pyrene	5960	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	193-39-5	
Naphthalene	617	ug/kg	60.7	5	04/19/18 18:12	04/20/18 18:51	91-20-3	
Phenanthrene	15800	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	85-01-8	
Pyrene	18000	ug/kg	607	50	04/19/18 18:12	04/23/18 20:51	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	81	%	42-125	5	04/19/18 18:12	04/20/18 18:51	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Surrogates

p-Terphenyl-d14 (S)	86	%	57-125	5	04/19/18 18:12	04/20/18 18:51	1718-51-0	
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8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	ND	ug/kg	1320	1	04/29/18 13:40	04/29/18 22:51	67-64-1	
Allyl chloride	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	107-05-1	L2
Benzene	ND	ug/kg	26.5	1	04/29/18 13:40	04/29/18 22:51	71-43-2	
Bromobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	108-86-1	
Bromochloromethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	74-97-5	
Bromodichloromethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	75-27-4	
Bromoform	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	75-25-2	
Bromomethane	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	74-83-9	
2-Butanone (MEK)	ND	ug/kg	331	1	04/29/18 13:40	04/29/18 22:51	78-93-3	
n-Butylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	104-51-8	
sec-Butylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	135-98-8	
tert-Butylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	98-06-6	
Carbon tetrachloride	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	56-23-5	
Chlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	108-90-7	
Chloroethane	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	75-00-3	
Chloroform	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	67-66-3	
Chloromethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	74-87-3	
2-Chlorotoluene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	95-49-8	
4-Chlorotoluene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	96-12-8	
Dibromochloromethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	106-93-4	
Dibromomethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	75-71-8	
1,1-Dichloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	75-34-3	
1,2-Dichloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	107-06-2	
1,1-Dichloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	156-60-5	
Dichlorofluoromethane	ND	ug/kg	662	1	04/29/18 13:40	04/29/18 22:51	75-43-4	
1,2-Dichloropropane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	78-87-5	
1,3-Dichloropropane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	142-28-9	
2,2-Dichloropropane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	594-20-7	
1,1-Dichloropropene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	60-29-7	
Ethylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	331	1	04/29/18 13:40	04/29/18 22:51	87-68-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-01 (3'-11' WM) **Lab ID: 10427824002** Collected: 04/18/18 12:30 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	98-82-8	
p-Isopropyltoluene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	99-87-6	
Methylene Chloride	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	331	1	04/29/18 13:40	04/29/18 22:51	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	1634-04-4	
Naphthalene	272	ug/kg	265	1	04/29/18 13:40	05/01/18 23:11	91-20-3	
n-Propylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	103-65-1	
Styrene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	79-34-5	
Tetrachloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	127-18-4	
Tetrahydrofuran	ND	ug/kg	2650	1	04/29/18 13:40	04/29/18 22:51	109-99-9	
Toluene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	79-00-5	
Trichloroethene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	79-01-6	
Trichlorofluoromethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	265	1	04/29/18 13:40	04/29/18 22:51	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	108-67-8	
Vinyl chloride	ND	ug/kg	26.5	1	04/29/18 13:40	04/29/18 22:51	75-01-4	
Xylene (Total)	ND	ug/kg	199	1	04/29/18 13:40	04/29/18 22:51	1330-20-7	
m&p-Xylene	ND	ug/kg	132	1	04/29/18 13:40	04/29/18 22:51	179601-23-1	
o-Xylene	ND	ug/kg	66.2	1	04/29/18 13:40	04/29/18 22:51	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	75-125	1	04/29/18 13:40	04/29/18 22:51	17060-07-0	
Toluene-d8 (S)	94	%	75-125	1	04/29/18 13:40	04/29/18 22:51	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	04/29/18 13:40	04/29/18 22:51	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	24.7	10	04/28/18 10:35	05/01/18 10:58	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	4.0	mg/kg	1.0	1		05/03/18 07:26	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.61	mg/kg	0.31	1	04/25/18 11:00	04/25/18 13:41	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/25/18 14:45	04/26/18 02:10	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID: 10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	14.9	1	04/25/18 10:56	04/30/18 15:33	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	309-00-2	
alpha-BHC	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	319-84-6	
beta-BHC	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	319-85-7	
delta-BHC	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	319-86-8	
gamma-BHC (Lindane)	67.4	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	58-89-9	
Chlordane (Technical)	ND	ug/kg	270	10	04/19/18 13:04	04/26/18 22:41	57-74-9	
alpha-Chlordane	67.0	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	5103-71-9	
gamma-Chlordane	37.0	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	5103-74-2	
4,4'-DDD	92.0	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	72-54-8	
4,4'-DDE	70.3	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	72-55-9	
4,4'-DDT	100	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	50-29-3	
Dieldrin	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	60-57-1	
Endosulfan I	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	959-98-8	
Endosulfan II	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	33213-65-9	
Endosulfan sulfate	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	1031-07-8	
Endrin	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	72-20-8	
Endrin aldehyde	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	7421-93-4	
Endrin ketone	ND	ug/kg	53.9	10	04/19/18 13:04	04/26/18 22:41	53494-70-5	
Heptachlor	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	76-44-8	
Heptachlor epoxide	ND	ug/kg	27.0	10	04/19/18 13:04	04/26/18 22:41	1024-57-3	
Methoxychlor	ND	ug/kg	270	10	04/19/18 13:04	04/26/18 22:41	72-43-5	
Toxaphene	ND	ug/kg	810	10	04/19/18 13:04	04/26/18 22:41	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	30-150	10	04/19/18 13:04	04/26/18 22:41	877-09-8	3M, D4, S4
Decachlorobiphenyl (S)	0	%	30-150	10	04/19/18 13:04	04/26/18 22:41	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11141-16-5	
PCB-1242 (Aroclor 1242)	3780	ug/kg	267	5	04/19/18 13:39	04/24/18 10:42	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	12672-29-6	
PCB-1254 (Aroclor 1254)	929	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	37324-23-5	
PCB-1268 (Aroclor 1268)	277	ug/kg	53.3	1	04/19/18 13:39	04/23/18 19:08	11100-14-4	
PCB, Total	4990	ug/kg	267	5	04/19/18 13:39	04/24/18 10:42	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	62	%	48-125	1	04/19/18 13:39	04/23/18 19:08	877-09-8	
Decachlorobiphenyl (S)	99	%	30-134	1	04/19/18 13:39	04/23/18 19:08	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID: 10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Acenaphthylene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	208-96-8	
Anthracene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	120-12-7	
Benzo(a)anthracene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	56-55-3	
Benzo(a)pyrene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	101-55-3	
Butylbenzylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	85-68-7	
Carbazole	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	59-50-7	
4-Chloroaniline	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	108-60-1	
2-Chloronaphthalene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	91-58-7	
2-Chlorophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	7005-72-3	
Chrysene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	53-70-3	
Dibenzofuran	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	120-83-2	
Diethylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	105-67-9	
Dimethylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	131-11-3	
Di-n-butylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2750	1	04/19/18 19:31	04/25/18 23:59	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	606-20-2	
Di-n-octylphthalate	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	122-66-7	
bis(2-Ethylhexyl)phthalate	27300	ug/kg	2670	5	04/19/18 19:31	04/26/18 16:11	117-81-7	
Fluoranthene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	206-44-0	
Fluorene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	87-68-3	
Hexachlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	118-74-1	
Hexachloroethane	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	193-39-5	
Isophorone	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	78-59-1	
1-Methylnaphthalene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	90-12-0	
2-Methylnaphthalene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	91-57-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) Lab ID: **10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2-Methylphenol(o-Cresol)	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1070	1	04/19/18 19:31	04/25/18 23:59		
Naphthalene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	91-20-3	
2-Nitroaniline	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	88-74-4	
3-Nitroaniline	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	99-09-2	
4-Nitroaniline	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	100-01-6	
Nitrobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	98-95-3	
2-Nitrophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	88-75-5	
4-Nitrophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	86-30-6	
Pentachlorophenol	ND	ug/kg	1090	1	04/19/18 19:31	04/25/18 23:59	87-86-5	
Phenanthrene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	85-01-8	
Phenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	108-95-2	
Pyrene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	535	1	04/19/18 19:31	04/25/18 23:59	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	59	%	43-125	1	04/19/18 19:31	04/25/18 23:59	4165-60-0	
2-Fluorobiphenyl (S)	56	%	30-132	1	04/19/18 19:31	04/25/18 23:59	321-60-8	
p-Terphenyl-d14 (S)	83	%	62-125	1	04/19/18 19:31	04/25/18 23:59	1718-51-0	
Phenol-d6 (S)	64	%	48-125	1	04/19/18 19:31	04/25/18 23:59	13127-88-3	
2-Fluorophenol (S)	65	%	40-125	1	04/19/18 19:31	04/25/18 23:59	367-12-4	
2,4,6-Tribromophenol (S)	67	%	60-125	1	04/19/18 19:31	04/25/18 23:59	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	83-32-9	
Acenaphthylene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	208-96-8	
Anthracene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	120-12-7	
Benzo(a)anthracene	179	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	56-55-3	
Benzo(a)pyrene	112	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	50-32-8	
Benzo(b)fluoranthene	209	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	207-08-9	
Chrysene	228	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	53-70-3	
Fluoranthene	394	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	206-44-0	
Fluorene	101	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	193-39-5	
Naphthalene	109	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	91-20-3	
Phenanthrene	332	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	85-01-8	
Pyrene	344	ug/kg	81.0	5	04/19/18 18:12	04/20/18 19:12	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	88	%	42-125	5	04/19/18 18:12	04/20/18 19:12	321-60-8	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID: 10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550						
Surrogates								
p-Terphenyl-d14 (S)	92	%	57-125	5	04/19/18 18:12	04/20/18 19:12	1718-51-0	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2110	1	04/29/18 13:40	04/29/18 23:24	67-64-1	
Allyl chloride	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	107-05-1	L2
Benzene	54.0	ug/kg	42.3	1	04/29/18 13:40	04/29/18 23:24	71-43-2	
Bromobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	108-86-1	
Bromochloromethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	74-97-5	
Bromodichloromethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	75-27-4	
Bromoform	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	75-25-2	
Bromomethane	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	74-83-9	
2-Butanone (MEK)	ND	ug/kg	528	1	04/29/18 13:40	04/29/18 23:24	78-93-3	
n-Butylbenzene	106	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	104-51-8	
sec-Butylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	135-98-8	
tert-Butylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	98-06-6	
Carbon tetrachloride	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	56-23-5	
Chlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	108-90-7	
Chloroethane	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	75-00-3	
Chloroform	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	67-66-3	
Chloromethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	74-87-3	
2-Chlorotoluene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	95-49-8	
4-Chlorotoluene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	96-12-8	
Dibromochloromethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	106-93-4	
Dibromomethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	541-73-1	
1,4-Dichlorobenzene	255	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	75-71-8	
1,1-Dichloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	75-34-3	
1,2-Dichloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	107-06-2	
1,1-Dichloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1060	1	04/29/18 13:40	04/29/18 23:24	75-43-4	
1,2-Dichloropropane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	78-87-5	
1,3-Dichloropropane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	142-28-9	
2,2-Dichloropropane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	594-20-7	
1,1-Dichloropropene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	60-29-7	
Ethylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	528	1	04/29/18 13:40	04/29/18 23:24	87-68-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Sample: FL-TT-02 (2'-10.5' WM) **Lab ID: 10427824003** Collected: 04/18/18 13:50 Received: 04/18/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Isopropylbenzene (Cumene)	110	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	98-82-8	
p-Isopropyltoluene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	99-87-6	
Methylene Chloride	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	75-09-2	L2
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	528	1	04/29/18 13:40	04/29/18 23:24	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	1634-04-4	
Naphthalene	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	91-20-3	
n-Propylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	103-65-1	
Styrene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	79-34-5	
Tetrachloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	127-18-4	
Tetrahydrofuran	ND	ug/kg	4230	1	04/29/18 13:40	04/29/18 23:24	109-99-9	
Toluene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	79-00-5	
Trichloroethene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	79-01-6	
Trichlorofluoromethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	423	1	04/29/18 13:40	04/29/18 23:24	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	106	1	04/29/18 13:40	04/29/18 23:24	108-67-8	
Vinyl chloride	ND	ug/kg	42.3	1	04/29/18 13:40	04/29/18 23:24	75-01-4	
Xylene (Total)	ND	ug/kg	317	1	04/29/18 13:40	04/29/18 23:24	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%	75-125	1	04/29/18 13:40	04/29/18 23:24	17060-07-0	
Toluene-d8 (S)	94	%	75-125	1	04/29/18 13:40	04/29/18 23:24	2037-26-5	
4-Bromofluorobenzene (S)	91	%	75-125	1	04/29/18 13:40	04/29/18 23:24	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	31.8	10	04/28/18 10:35	05/01/18 10:58	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	29.0	mg/kg	1.0	1		05/03/18 07:26	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.78	mg/kg	0.60	1	04/25/18 11:00	04/25/18 13:42	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.98	1	04/25/18 14:45	04/26/18 01:50	16984-48-8	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 141683 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 560161 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.05	04/30/18 13:39	N3

METHOD BLANK: 560162 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	2.98	04/30/18 13:46	N3

METHOD BLANK: 560163 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.04	04/30/18 13:53	N3

LABORATORY CONTROL SAMPLE: 560164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	104	119	115	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 560165 560166

Parameter	Units	10427354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	357	357	354	388	99	108	65-135	9	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 535145 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2910764 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	05/02/18 11:15	
a,a,a-Trifluorotoluene (S)	%	99	80-150	05/02/18 11:15	

LABORATORY CONTROL SAMPLE & LCSD: 2907780

Parameter	Units	2907781		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Gasoline Range Organics	mg/kg	50	40.4	81	84	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%			99	99	80-150			

MATRIX SPIKE SAMPLE: 2910759

Parameter	Units	10427824002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	56.5	67.3	119	80-120	
a,a,a-Trifluorotoluene (S)	%				98	80-150	

SAMPLE DUPLICATE: 2910758

Parameter	Units	10428096003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	4.6J		20	
a,a,a-Trifluorotoluene (S)	%	99	99	3		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533419 Analysis Method: EPA 7471
 QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
 Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897699 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	04/22/18 15:58	

LABORATORY CONTROL SAMPLE: 2897700

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.53	110	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897701 2897702

Parameter	Units	10426879001		2897701		2897702		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Mercury	mg/kg	<0.018	<0.018	.47	.5	0.48	0.46	103	93	80-120	4	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533415 Analysis Method: EPA 6010C
QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897683 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	10.0	04/23/18 10:48	
Barium	mg/kg	ND	0.50	04/23/18 10:48	
Boron	mg/kg	ND	7.5	04/23/18 10:48	
Copper	mg/kg	ND	0.50	04/23/18 10:48	
Iron	mg/kg	ND	2.5	04/23/18 10:48	
Manganese	mg/kg	ND	0.25	04/23/18 10:48	
Nickel	mg/kg	ND	1.0	04/23/18 10:48	
Silver	mg/kg	ND	0.50	04/23/18 10:48	
Tin	mg/kg	ND	3.8	04/23/18 10:48	
Titanium	mg/kg	ND	1.2	04/23/18 10:48	
Zinc	mg/kg	ND	1.0	04/23/18 10:48	

LABORATORY CONTROL SAMPLE: 2897684

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	1000	997	100	80-120	
Barium	mg/kg	50	51.0	102	80-120	
Boron	mg/kg	50	46.7	93	80-120	
Copper	mg/kg	50	49.1	98	80-120	
Iron	mg/kg	1000	1010	101	80-120	
Manganese	mg/kg	50	50.9	102	80-120	
Nickel	mg/kg	50	49.8	100	80-120	
Silver	mg/kg	25	23.5	94	80-120	
Tin	mg/kg	50	49.4	99	80-120	
Titanium	mg/kg	50	49.8	100	80-120	
Zinc	mg/kg	50	48.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897685 2897686

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427793001 Result	Spike Conc.	Spike Conc.	Result						
Aluminum	mg/kg	34800	990	952	35400	35400	64	61	75-125	0	20 P6
Barium	mg/kg	1320	49.5	47.6	1320	1320	-1	0	75-125	0	20 P6
Boron	mg/kg	43.3	49.5	47.6	87.4	85.7	89	89	75-125	2	20
Copper	mg/kg	2140	49.5	47.6	2090	2100	-85	-66	75-125	1	20 P6
Iron	mg/kg	31500	990	952	31000	31000	-51	-51	75-125	0	20 P6
Manganese	mg/kg	8040	49.5	47.6	7800	8030	-469	-22	75-125	3	20 P6
Nickel	mg/kg	113	49.5	47.6	148	147	70	71	75-125	1	20 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Parameter	Units	2897685		2897686		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10427793001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Silver	mg/kg	18.5	24.8	23.8	48.7	49.0	122	128	75-125	1	20	M1	
Tin	mg/kg	94.8	49.5	47.6	127	127	66	67	75-125	1	20	M1	
Titanium	mg/kg	1650	49.5	47.6	1620	1690	-64	67	75-125	4	20	P6	
Zinc	mg/kg	1960	49.5	47.6	1950	1930	-21	-53	75-125	1	20	P6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 438855 Analysis Method: EPA 6020

QC Batch Method: EPA 3050B Analysis Description: 6020 MET

Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2027873 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.19	04/26/18 02:38	N2

LABORATORY CONTROL SAMPLE: 2027874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.9	106	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027875 2027876

Parameter	Units	2027875		2027876		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	5.4	4.87	4.87	7.0	6.1	34	15	75-125	14	20 M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533412 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897671 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.48	04/21/18 02:51	
Arsenic	mg/kg	ND	0.48	04/21/18 02:51	
Beryllium	mg/kg	ND	0.19	04/21/18 02:51	
Cadmium	mg/kg	ND	0.076	04/21/18 02:51	
Cobalt	mg/kg	ND	0.48	04/21/18 02:51	
Lead	mg/kg	ND	0.095	04/23/18 17:49	
Lithium	mg/kg	ND	0.48	04/21/18 02:51	
Selenium	mg/kg	ND	0.48	04/21/18 02:51	
Strontium	mg/kg	ND	0.48	04/21/18 02:51	
Vanadium	mg/kg	ND	0.95	04/21/18 02:51	

LABORATORY CONTROL SAMPLE: 2897672

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	47.6	100	80-120	
Arsenic	mg/kg	47.6	47.9	101	80-120	
Beryllium	mg/kg	47.6	47.3	99	80-120	
Cadmium	mg/kg	47.6	47.1	99	80-120	
Cobalt	mg/kg	47.6	49.3	104	80-120	
Lead	mg/kg	47.6	48.7	102	80-120	
Lithium	mg/kg	47.6	45.4	95	80-120	
Selenium	mg/kg	47.6	47.6	100	80-120	
Strontium	mg/kg	47.6	47.2	99	80-120	
Vanadium	mg/kg	47.6	47.7	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897673 2897674

Parameter	Units	10427861001		2897673		2897674		% Rec	% Rec	% Rec	Max	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result					
Antimony	mg/kg	0.59	49.5	48.5	21.6	20.0	42	40	75-125	8	20	M6
Arsenic	mg/kg	18.4	49.5	48.5	70.6	64.2	105	94	75-125	9	20	
Beryllium	mg/kg	0.60	49.5	48.5	46.4	44.0	92	90	75-125	5	20	
Cadmium	mg/kg	0.45	49.5	48.5	51.2	46.6	103	95	75-125	9	20	
Cobalt	mg/kg	6.1	49.5	48.5	59.2	53.9	107	99	75-125	9	20	
Lead	mg/kg	39.8	49.5	48.5	87.6	85.0	97	93	75-125	3	20	
Lithium	mg/kg	11.0	49.5	48.5	55.2	54.2	89	89	75-125	2	20	
Selenium	mg/kg	1.0	49.5	48.5	49.9	46.1	99	93	75-125	8	20	
Strontium	mg/kg	136	49.5	48.5	199	177	127	85	75-125	11	20	M6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2897673		2897674								
Parameter	Units	10427861001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Vanadium	mg/kg	22.3	49.5	48.5	76.0	68.8	108	96	75-125	10	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 534034

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10427824001, 10427824002, 10427824003

SAMPLE DUPLICATE: 2901166

Parameter	Units	10428311003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.7	14.8	8	30	

SAMPLE DUPLICATE: 2901255

Parameter	Units	10427906006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.4	21.5	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 534992 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2906940 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1,1-Trichloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1,2-Trichloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	05/02/18 19:07	
1,1-Dichloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,1-Dichloroethene	ug/kg	ND	50.0	05/02/18 19:07	
1,1-Dichloropropene	ug/kg	ND	50.0	05/02/18 19:07	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,2,3-Trichloropropane	ug/kg	ND	200	05/02/18 19:07	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	05/02/18 19:07	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	05/02/18 19:07	
1,2-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,2-Dichloroethane	ug/kg	ND	50.0	05/02/18 19:07	
1,2-Dichloropropane	ug/kg	ND	50.0	05/02/18 19:07	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,3-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
1,3-Dichloropropane	ug/kg	ND	50.0	05/02/18 19:07	
1,4-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
2,2-Dichloropropane	ug/kg	ND	200	05/02/18 19:07	
2-Butanone (MEK)	ug/kg	ND	250	05/02/18 19:07	
2-Chlorotoluene	ug/kg	ND	50.0	05/02/18 19:07	
4-Chlorotoluene	ug/kg	ND	50.0	05/02/18 19:07	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	05/02/18 19:07	
Acetone	ug/kg	ND	1000	05/02/18 19:07	
Allyl chloride	ug/kg	ND	200	05/02/18 19:07	
Benzene	ug/kg	ND	20.0	05/02/18 19:07	
Bromobenzene	ug/kg	ND	50.0	05/02/18 19:07	
Bromochloromethane	ug/kg	ND	50.0	05/02/18 19:07	
Bromodichloromethane	ug/kg	ND	50.0	05/02/18 19:07	
Bromoform	ug/kg	ND	500	05/02/18 19:07	MN
Bromomethane	ug/kg	ND	500	05/02/18 19:07	
Carbon tetrachloride	ug/kg	ND	50.0	05/02/18 19:07	
Chlorobenzene	ug/kg	ND	50.0	05/02/18 19:07	
Chloroethane	ug/kg	ND	500	05/02/18 19:07	
Chloroform	ug/kg	ND	50.0	05/02/18 19:07	
Chloromethane	ug/kg	ND	200	05/02/18 19:07	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	05/02/18 19:07	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	05/02/18 19:07	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

METHOD BLANK: 2906940 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	05/02/18 19:07	
Dibromomethane	ug/kg	ND	50.0	05/02/18 19:07	
Dichlorodifluoromethane	ug/kg	ND	200	05/02/18 19:07	
Dichlorofluoromethane	ug/kg	ND	500	05/02/18 19:07	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	05/02/18 19:07	
Ethylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
Hexachloro-1,3-butadiene	ug/kg	ND	250	05/02/18 19:07	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	05/02/18 19:07	
m&p-Xylene	ug/kg	ND	100	05/02/18 19:07	
Methyl-tert-butyl ether	ug/kg	ND	50.0	05/02/18 19:07	
Methylene Chloride	ug/kg	ND	200	05/02/18 19:07	
n-Butylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
n-Propylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
Naphthalene	ug/kg	ND	200	05/02/18 19:07	
o-Xylene	ug/kg	ND	50.0	05/02/18 19:07	
p-Isopropyltoluene	ug/kg	ND	50.0	05/02/18 19:07	
sec-Butylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
Styrene	ug/kg	ND	50.0	05/02/18 19:07	
tert-Butylbenzene	ug/kg	ND	50.0	05/02/18 19:07	
Tetrachloroethene	ug/kg	ND	50.0	05/02/18 19:07	
Tetrahydrofuran	ug/kg	ND	2000	05/02/18 19:07	
Toluene	ug/kg	ND	50.0	05/02/18 19:07	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	05/02/18 19:07	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	05/02/18 19:07	
Trichloroethene	ug/kg	ND	50.0	05/02/18 19:07	
Trichlorofluoromethane	ug/kg	ND	200	05/02/18 19:07	
Vinyl chloride	ug/kg	ND	20.0	05/02/18 19:07	
Xylene (Total)	ug/kg	ND	150	05/02/18 19:07	
1,2-Dichloroethane-d4 (S)	%	97	75-125	05/02/18 19:07	
4-Bromofluorobenzene (S)	%	98	75-125	05/02/18 19:07	
Toluene-d8 (S)	%	96	75-125	05/02/18 19:07	

LABORATORY CONTROL SAMPLE & LCSD: 2906941

Parameter	Units	2906942		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
1,1,1,2-Tetrachloroethane	ug/kg	1000	854	85	98	59-125	14	20	
1,1,1-Trichloroethane	ug/kg	1000	942	94	112	59-125	18	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	721	72	82	58-125	13	20	
1,1,2-Trichloroethane	ug/kg	1000	784	78	88	64-125	12	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	744	74	92	65-125	22	20	R1
1,1-Dichloroethane	ug/kg	1000	717	72	82	63-125	13	20	
1,1-Dichloroethene	ug/kg	1000	748	75	89	59-125	18	20	
1,1-Dichloropropene	ug/kg	1000	893	89	98	64-125	9	20	
1,2,3-Trichlorobenzene	ug/kg	1000	766	77	80	55-126	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE & LCS: 2906941

2906942

Parameter	Units	Spike Conc.	LCS Result	LCS Result	LCS % Rec	LCS % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,3-Trichloropropane	ug/kg	1000	816	921	82	92	62-125	12	20	
1,2,4-Trichlorobenzene	ug/kg	1000	737	788	74	79	62-125	7	20	
1,2,4-Trimethylbenzene	ug/kg	1000	745	842	75	84	59-125	12	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1950	2150	78	86	54-125	10	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	851	949	85	95	64-125	11	20	
1,2-Dichlorobenzene	ug/kg	1000	787	855	79	86	63-125	8	20	
1,2-Dichloroethane	ug/kg	1000	724	850	72	85	57-125	16	20	
1,2-Dichloropropane	ug/kg	1000	689	795	69	79	67-125	14	20	
1,3,5-Trimethylbenzene	ug/kg	1000	794	878	79	88	59-125	10	20	
1,3-Dichlorobenzene	ug/kg	1000	762	832	76	83	64-125	9	20	
1,3-Dichloropropane	ug/kg	1000	726	849	73	85	64-125	16	20	
1,4-Dichlorobenzene	ug/kg	1000	753	848	75	85	63-125	12	20	
2,2-Dichloropropane	ug/kg	1000	783	872	78	87	37-126	11	20	
2-Butanone (MEK)	ug/kg	5000	3350	3680	67	74	48-125	9	20	
2-Chlorotoluene	ug/kg	1000	762	851	76	85	62-125	11	20	
4-Chlorotoluene	ug/kg	1000	731	860	73	86	63-125	16	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3210	3620	64	72	52-135	12	20	
Acetone	ug/kg	5000	4840	5150	97	103	65-125	6	20	
Allyl chloride	ug/kg	1000	512	624	51	62	52-125	20	20	L2
Benzene	ug/kg	1000	786	858	79	86	61-125	9	20	
Bromobenzene	ug/kg	1000	809	901	81	90	64-125	11	20	
Bromochloromethane	ug/kg	1000	843	905	84	91	65-125	7	20	
Bromodichloromethane	ug/kg	1000	824	930	82	93	57-125	12	20	
Bromoform	ug/kg	1000	748	929	75	93	57-125	22	20	R1
Bromomethane	ug/kg	1000	794	803	79	80	60-125	1	20	
Carbon tetrachloride	ug/kg	1000	919	1080	92	108	58-125	16	20	
Chlorobenzene	ug/kg	1000	754	871	75	87	66-125	14	20	
Chloroethane	ug/kg	1000	793	928	79	93	62-125	16	20	
Chloroform	ug/kg	1000	826	895	83	90	59-125	8	20	
Chloromethane	ug/kg	1000	538	572	54	57	50-125	6	20	
cis-1,2-Dichloroethene	ug/kg	1000	831	918	83	92	61-125	10	20	
cis-1,3-Dichloropropene	ug/kg	1000	784	885	78	88	61-125	12	20	
Dibromochloromethane	ug/kg	1000	788	875	79	88	60-125	10	20	
Dibromomethane	ug/kg	1000	821	937	82	94	69-125	13	20	
Dichlorodifluoromethane	ug/kg	1000	623	629	62	63	38-125	1	20	
Dichlorofluoromethane	ug/kg	1000	1000	867	100	87	67-125	15	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1250	1420	125	142	60-125	13	20	L3,SS
Ethylbenzene	ug/kg	1000	802	917	80	92	62-125	13	20	
Hexachloro-1,3-butadiene	ug/kg	1000	830	890	83	89	56-125	7	20	
Isopropylbenzene (Cumene)	ug/kg	1000	851	946	85	95	65-125	11	20	
m&p-Xylene	ug/kg	2000	1510	1730	75	87	61-125	14	20	
Methyl-tert-butyl ether	ug/kg	1000	709	852	71	85	59-125	18	20	
Methylene Chloride	ug/kg	1000	627	817	63	82	64-125	26	20	L2,R1
n-Butylbenzene	ug/kg	1000	770	856	77	86	59-125	11	20	
n-Propylbenzene	ug/kg	1000	763	851	76	85	61-125	11	20	
Naphthalene	ug/kg	1000	747	841	75	84	53-125	12	20	
o-Xylene	ug/kg	1000	776	886	78	89	61-125	13	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE & LCSD:		2906941		2906942							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
p-Isopropyltoluene	ug/kg	1000	777	910	78	91	63-125	16	20		
sec-Butylbenzene	ug/kg	1000	789	879	79	88	62-125	11	20		
Styrene	ug/kg	1000	812	911	81	91	66-125	12	20		
tert-Butylbenzene	ug/kg	1000	773	873	77	87	64-125	12	20		
Tetrachloroethene	ug/kg	1000	850	952	85	95	67-125	11	20		
Tetrahydrofuran	ug/kg	10000	10800	11700	108	117	62-125	7	20		
Toluene	ug/kg	1000	727	832	73	83	61-125	14	20		
trans-1,2-Dichloroethene	ug/kg	1000	774	938	77	94	64-125	19	20		
trans-1,3-Dichloropropene	ug/kg	1000	785	908	79	91	56-125	14	20		
Trichloroethene	ug/kg	1000	825	958	83	96	67-125	15	20		
Trichlorofluoromethane	ug/kg	1000	1090	1130	109	113	65-125	3	20		
Vinyl chloride	ug/kg	1000	632	686	63	69	57-125	8	20		
Xylene (Total)	ug/kg	3000	2280	2620	76	87	62-125	14	20		
1,2-Dichloroethane-d4 (S)	%				95	99	75-125				
4-Bromofluorobenzene (S)	%				96	99	75-125				
Toluene-d8 (S)	%				98	98	75-125				

MATRIX SPIKE SAMPLE:		2906943		10429482001							
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers				
1,1,1,2-Tetrachloroethane	ug/kg	ND	1000	1300	130	64-146					
1,1,1-Trichloroethane	ug/kg	ND	1000	1430	143	56-148					
1,1,2,2-Tetrachloroethane	ug/kg	ND	1000	1230	123	36-150					
1,1,2-Trichloroethane	ug/kg	ND	1000	1260	125	67-148					
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1000	1110	111	60-142					
1,1-Dichloroethane	ug/kg	ND	1000	1210	121	57-140					
1,1-Dichloroethene	ug/kg	ND	1000	1100	109	59-139					
1,1-Dichloropropene	ug/kg	ND	1000	1320	132	61-142					
1,2,3-Trichlorobenzene	ug/kg	ND	1000	1120	112	69-150					
1,2,3-Trichloropropane	ug/kg	ND	1000	1250	125	64-150					
1,2,4-Trichlorobenzene	ug/kg	ND	1000	1180	118	71-149					
1,2,4-Trimethylbenzene	ug/kg	ND	1000	1170	117	67-149					
1,2-Dibromo-3-chloropropane	ug/kg	ND	2500	2930	117	61-150					
1,2-Dibromoethane (EDB)	ug/kg	ND	1000	1310	131	67-147					
1,2-Dichlorobenzene	ug/kg	ND	1000	1220	122	70-142					
1,2-Dichloroethane	ug/kg	ND	1000	1110	111	58-132					
1,2-Dichloropropane	ug/kg	ND	1000	1090	109	64-144					
1,3,5-Trimethylbenzene	ug/kg	ND	1000	1270	127	71-146					
1,3-Dichlorobenzene	ug/kg	ND	1000	1170	117	71-142					
1,3-Dichloropropane	ug/kg	ND	1000	1180	118	68-140					
1,4-Dichlorobenzene	ug/kg	ND	1000	1170	117	68-142					
2,2-Dichloropropane	ug/kg	ND	1000	1180	118	34-150					
2-Butanone (MEK)	ug/kg	ND	5010	5840	117	51-150					
2-Chlorotoluene	ug/kg	ND	1000	1270	127	66-144					
4-Chlorotoluene	ug/kg	ND	1000	1200	120	66-140					

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

MATRIX SPIKE SAMPLE: 2906943		10429482001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5010	4950	99	63-150	
Acetone	ug/kg	ND	5010	7870	157	54-150	M1
Allyl chloride	ug/kg	ND	1000	790	79	53-135	
Benzene	ug/kg	ND	1000	1210	121	65-135	
Bromobenzene	ug/kg	ND	1000	1330	133	71-141	
Bromochloromethane	ug/kg	ND	1000	1290	129	62-145	
Bromodichloromethane	ug/kg	ND	1000	1240	124	59-148	
Bromoform	ug/kg	ND	1000	1200	120	57-145	
Bromomethane	ug/kg	ND	1000	1050	105	51-129	
Carbon tetrachloride	ug/kg	ND	1000	1390	139	55-144	
Chlorobenzene	ug/kg	ND	1000	1180	118	70-142	
Chloroethane	ug/kg	ND	1000	1170	116	61-135	
Chloroform	ug/kg	ND	1000	1250	124	58-135	
Chloromethane	ug/kg	ND	1000	732	73	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1000	1290	129	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1000	1200	120	62-142	
Dibromochloromethane	ug/kg	ND	1000	1180	118	65-141	
Dibromomethane	ug/kg	ND	1000	1270	127	72-150	
Dichlorodifluoromethane	ug/kg	ND	1000	751	75	30-125	
Dichlorofluoromethane	ug/kg	ND	1000	1410	141	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1000	2080	207	62-135	M0,SS
Ethylbenzene	ug/kg	ND	1000	1230	123	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1000	1330	133	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1000	1270	127	75-148	
m&p-Xylene	ug/kg	ND	2000	2320	116	74-142	
Methyl-tert-butyl ether	ug/kg	ND	1000	1050	105	63-139	
Methylene Chloride	ug/kg	ND	1000	988	99	58-135	
n-Butylbenzene	ug/kg	ND	1000	1210	121	63-150	
n-Propylbenzene	ug/kg	ND	1000	1270	126	70-146	
Naphthalene	ug/kg	ND	1000	1160	116	63-150	
o-Xylene	ug/kg	ND	1000	1190	119	74-141	
p-Isopropyltoluene	ug/kg	ND	1000	1260	126	72-150	
sec-Butylbenzene	ug/kg	ND	1000	1200	120	66-150	
Styrene	ug/kg	ND	1000	1270	127	72-146	
tert-Butylbenzene	ug/kg	ND	1000	1220	122	71-148	
Tetrachloroethene	ug/kg	ND	1000	1300	130	70-150	
Tetrahydrofuran	ug/kg	ND	10000	16600	165	62-150	M1
Toluene	ug/kg	ND	1000	1150	115	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1000	1120	112	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1000	1200	120	57-147	
Trichloroethene	ug/kg	ND	1000	1270	127	62-150	
Trichlorofluoromethane	ug/kg	ND	1000	1560	156	51-150	M1
Vinyl chloride	ug/kg	ND	1000	881	88	45-132	
Xylene (Total)	ug/kg	ND	3000	3520	117	75-140	
1,2-Dichloroethane-d4 (S)	%				97	75-125	
4-Bromofluorobenzene (S)	%				105	75-125	
Toluene-d8 (S)	%				100	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

SAMPLE DUPLICATE: 2906944

Parameter	Units	10427824002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

SAMPLE DUPLICATE: 2906944

Parameter	Units	10427824002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
m&p-Xylene	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	272	295	8	30	
o-Xylene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	98	97	11		
4-Bromofluorobenzene (S)	%	99	93	17		
Toluene-d8 (S)	%	94	96	9		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533317

Analysis Method: EPA 8081B

QC Batch Method: EPA 3550

Analysis Description: 8081S GCS Pesticides

Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2896992

Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	04/26/18 20:33	
4,4'-DDE	ug/kg	ND	3.3	04/26/18 20:33	
4,4'-DDT	ug/kg	ND	3.3	04/26/18 20:33	
Aldrin	ug/kg	ND	1.7	04/26/18 20:33	
alpha-BHC	ug/kg	ND	1.7	04/26/18 20:33	
alpha-Chlordane	ug/kg	ND	1.7	04/26/18 20:33	
beta-BHC	ug/kg	ND	1.7	04/26/18 20:33	
Chlordane (Technical)	ug/kg	ND	16.7	04/26/18 20:33	
delta-BHC	ug/kg	ND	1.7	04/26/18 20:33	
Dieldrin	ug/kg	ND	3.3	04/26/18 20:33	
Endosulfan I	ug/kg	ND	1.7	04/26/18 20:33	
Endosulfan II	ug/kg	ND	3.3	04/26/18 20:33	
Endosulfan sulfate	ug/kg	ND	3.3	04/26/18 20:33	
Endrin	ug/kg	ND	3.3	04/26/18 20:33	
Endrin aldehyde	ug/kg	ND	3.3	04/26/18 20:33	
Endrin ketone	ug/kg	ND	3.3	04/26/18 20:33	
gamma-BHC (Lindane)	ug/kg	ND	1.7	04/26/18 20:33	
gamma-Chlordane	ug/kg	ND	1.7	04/26/18 20:33	
Heptachlor	ug/kg	ND	1.7	04/26/18 20:33	
Heptachlor epoxide	ug/kg	ND	1.7	04/26/18 20:33	
Methoxychlor	ug/kg	ND	16.7	04/26/18 20:33	
Toxaphene	ug/kg	ND	50.0	04/26/18 20:33	
Decachlorobiphenyl (S)	%	98	30-150	04/26/18 20:33	
Tetrachloro-m-xylene (S)	%	105	30-150	04/26/18 20:33	

LABORATORY CONTROL SAMPLE: 2896993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	35.6	107	62-127	
4,4'-DDE	ug/kg	33.3	34.8	104	66-125	
4,4'-DDT	ug/kg	33.3	31.8	96	67-128	
Aldrin	ug/kg	16.7	16.5	99	66-125	
alpha-BHC	ug/kg	16.7	17.5	105	64-125	
alpha-Chlordane	ug/kg	16.7	16.7	100	68-125	
beta-BHC	ug/kg	16.7	16.8	101	69-125	
delta-BHC	ug/kg	16.7	14.3	86	42-133	
Dieldrin	ug/kg	33.3	37.3	112	69-126	
Endosulfan I	ug/kg	16.7	16.0	96	63-125	
Endosulfan II	ug/kg	33.3	35.8	107	69-125	
Endosulfan sulfate	ug/kg	33.3	31.8	95	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE: 2896993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	34.5	103	69-125	
Endrin aldehyde	ug/kg	33.3	34.0	102	65-125	
Endrin ketone	ug/kg	33.3	36.0	108	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	17.4	104	67-125	
gamma-Chlordane	ug/kg	16.7	15.3	92	63-125	
Heptachlor	ug/kg	16.7	16.5	99	69-125	
Heptachlor epoxide	ug/kg	16.7	17.0	102	68-125	
Methoxychlor	ug/kg	167	160	96	65-134	
Decachlorobiphenyl (S)	%			100	30-150	
Tetrachloro-m-xylene (S)	%			107	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896994 2896995

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427824001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	ND	43.8	43.8	79J	92J	180	210	56-125	20	M6
4,4'-DDE	ug/kg	ND	43.8	43.8	61.7J	61.2J	141	140	32-150	20	
4,4'-DDT	ug/kg	ND	43.8	43.8	ND	105J	49	239	60-132	20	M6
Aldrin	ug/kg	ND	21.9	21.9	29.1J	43.3J	133	198	56-125	20	M6
alpha-BHC	ug/kg	ND	21.9	21.9	30.3J	25.5J	138	116	54-136	20	M6
alpha-Chlordane	ug/kg	ND	21.9	21.9	43.8J	97.5J	200	445	54-133	20	M6
beta-BHC	ug/kg	ND	21.9	21.9	ND	69.2J	190	315	30-150	20	M6
delta-BHC	ug/kg	ND	21.9	21.9	21.3J	19.8J	97	90	45-145	20	
Dieldrin	ug/kg	ND	43.8	43.8	67.4J	76.3J	154	174	47-150	20	M6
Endosulfan I	ug/kg	ND	21.9	21.9	23.9J	22.6J	109	103	35-145	20	
Endosulfan II	ug/kg	ND	43.8	43.8	53.3J	50.6J	122	115	50-147	20	
Endosulfan sulfate	ug/kg	ND	43.8	43.8	44.3J	43.8J	101	100	54-132	20	
Endrin	ug/kg	ND	43.8	43.8	49.3J	39.3J	113	90	62-125	20	
Endrin aldehyde	ug/kg	ND	43.8	43.8	48.2J	49.1J	110	112	33-150	20	
Endrin ketone	ug/kg	ND	43.8	43.8	83.8J	97.2J	191	222	56-144	20	M6
gamma-BHC (Lindane)	ug/kg	ND	21.9	21.9	26.3J	27.8J	120	127	63-125	20	M6
gamma-Chlordane	ug/kg	ND	21.9	21.9	43.3J	88.3J	198	403	45-132	20	M6
Heptachlor	ug/kg	ND	21.9	21.9	33.4J	24.2J	152	110	51-142	20	M6
Heptachlor epoxide	ug/kg	ND	21.9	21.9	27.4J	27J	125	123	50-142	20	
Methoxychlor	ug/kg	ND	219	219	261J	243J	119	111	58-139	20	
Decachlorobiphenyl (S)	%						0	0	30-150		S4
Tetrachloro-m-xylene (S)	%						0	0	30-150		2M, D3, S4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 533330 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897062 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/23/18 17:02	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/23/18 17:02	
Decachlorobiphenyl (S)	%	125	30-134	04/23/18 17:02	CH
Tetrachloro-m-xylene (S)	%	88	48-125	04/23/18 17:02	

LABORATORY CONTROL SAMPLE: 2897063

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	502	75	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	549	82	62-125	
Decachlorobiphenyl (S)	%			126	30-134	CH
Tetrachloro-m-xylene (S)	%			88	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897064 2897065

Parameter	Units	10427642001		2897065		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
PCB-1016 (Aroclor 1016)	ug/kg	ND	853	852	783	92	101	30-150	9	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	853	852	757	89	88	30-138	1	30	
Decachlorobiphenyl (S)	%					110	108	30-134			CH
Tetrachloro-m-xylene (S)	%					78	75	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533315 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2896984 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,2-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/23/18 16:07	
1,3-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1,4-Dichlorobenzene	ug/kg	ND	330	04/23/18 16:07	
1-Methylnaphthalene	ug/kg	ND	330	04/23/18 16:07	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dichlorophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dimethylphenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dinitrophenol	ug/kg	ND	330	04/23/18 16:07	
2,4-Dinitrotoluene	ug/kg	ND	330	04/23/18 16:07	
2,6-Dinitrotoluene	ug/kg	ND	330	04/23/18 16:07	
2-Chloronaphthalene	ug/kg	ND	330	04/23/18 16:07	
2-Chlorophenol	ug/kg	ND	330	04/23/18 16:07	
2-Methylnaphthalene	ug/kg	ND	330	04/23/18 16:07	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/23/18 16:07	
2-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
2-Nitrophenol	ug/kg	ND	330	04/23/18 16:07	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/23/18 16:07	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/23/18 16:07	
3-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/23/18 16:07	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/23/18 16:07	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/23/18 16:07	
4-Chloroaniline	ug/kg	ND	330	04/23/18 16:07	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/23/18 16:07	
4-Nitroaniline	ug/kg	ND	330	04/23/18 16:07	
4-Nitrophenol	ug/kg	ND	330	04/23/18 16:07	
Acenaphthene	ug/kg	ND	330	04/23/18 16:07	
Acenaphthylene	ug/kg	ND	330	04/23/18 16:07	
Anthracene	ug/kg	ND	330	04/23/18 16:07	
Benzo(a)anthracene	ug/kg	ND	330	04/23/18 16:07	
Benzo(a)pyrene	ug/kg	ND	330	04/23/18 16:07	
Benzo(b)fluoranthene	ug/kg	ND	330	04/23/18 16:07	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/23/18 16:07	
Benzo(k)fluoranthene	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/23/18 16:07	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/23/18 16:07	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/23/18 16:07	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

METHOD BLANK: 2896984 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/23/18 16:07	
Carbazole	ug/kg	ND	330	04/23/18 16:07	
Chrysene	ug/kg	ND	330	04/23/18 16:07	
Di-n-butylphthalate	ug/kg	ND	330	04/23/18 16:07	
Di-n-octylphthalate	ug/kg	ND	330	04/23/18 16:07	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/23/18 16:07	
Dibenzofuran	ug/kg	ND	330	04/23/18 16:07	
Diethylphthalate	ug/kg	ND	330	04/23/18 16:07	
Dimethylphthalate	ug/kg	ND	330	04/23/18 16:07	
Fluoranthene	ug/kg	ND	330	04/23/18 16:07	
Fluorene	ug/kg	ND	330	04/23/18 16:07	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/23/18 16:07	
Hexachlorobenzene	ug/kg	ND	330	04/23/18 16:07	
Hexachloroethane	ug/kg	ND	330	04/23/18 16:07	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/23/18 16:07	
Isophorone	ug/kg	ND	330	04/23/18 16:07	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/23/18 16:07	
N-Nitrosodimethylamine	ug/kg	ND	330	04/23/18 16:07	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/23/18 16:07	
Naphthalene	ug/kg	ND	330	04/23/18 16:07	
Nitrobenzene	ug/kg	ND	330	04/23/18 16:07	
Pentachlorophenol	ug/kg	ND	670	04/23/18 16:07	
Phenanthrene	ug/kg	ND	330	04/23/18 16:07	
Phenol	ug/kg	ND	330	04/23/18 16:07	
Pyrene	ug/kg	ND	330	04/23/18 16:07	
2,4,6-Tribromophenol (S)	%	69	60-125	04/23/18 16:07	
2-Fluorobiphenyl (S)	%	67	30-132	04/23/18 16:07	
2-Fluorophenol (S)	%	64	40-125	04/23/18 16:07	
Nitrobenzene-d5 (S)	%	63	43-125	04/23/18 16:07	
p-Terphenyl-d14 (S)	%	79	62-125	04/23/18 16:07	
Phenol-d6 (S)	%	63	48-125	04/23/18 16:07	

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1210	73	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1230	74	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1300	78	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1230	74	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1220	73	39-125	
1-Methylnaphthalene	ug/kg	1670	1320	79	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1340	81	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1310	79	61-125	
2,4-Dichlorophenol	ug/kg	1670	1370	82	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1280	77	51-125	
2,4-Dinitrophenol	ug/kg	1670	1130	68	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1550	93	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1470	88	63-125	
2-Chloronaphthalene	ug/kg	1670	1310	79	61-125	
2-Chlorophenol	ug/kg	1670	1230	74	46-125	
2-Methylnaphthalene	ug/kg	1670	1290	77	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1240	74	50-125	
2-Nitroaniline	ug/kg	1670	1350	81	61-125	
2-Nitrophenol	ug/kg	1670	1340	80	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1290	77	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1370	82	47-125	
3-Nitroaniline	ug/kg	1670	1370	82	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1540J	93	30-141	4M
4-Bromophenylphenyl ether	ug/kg	1670	1340	81	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1420	85	64-125	
4-Chloroaniline	ug/kg	1670	1080	65	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1350	81	64-125	
4-Nitroaniline	ug/kg	1670	1330	80	59-125	
4-Nitrophenol	ug/kg	1670	1240	75	54-125	
Acenaphthene	ug/kg	1670	1310	79	62-125	
Acenaphthylene	ug/kg	1670	1330	80	61-125	
Anthracene	ug/kg	1670	1350	81	66-125	
Benzo(a)anthracene	ug/kg	1670	1430	86	69-125	
Benzo(a)pyrene	ug/kg	1670	1410	85	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1440	87	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1450	87	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1400	84	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1230	74	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1130	68	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	978	59	37-125	4M
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1600	96	69-131	
Butylbenzylphthalate	ug/kg	1670	1550	93	69-129	
Carbazole	ug/kg	1670	1430	86	66-125	
Chrysene	ug/kg	1670	1410	85	68-125	
Di-n-butylphthalate	ug/kg	1670	1520	91	69-125	
Di-n-octylphthalate	ug/kg	1670	1640	98	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1480	89	64-125	
Dibenzofuran	ug/kg	1670	1380	83	65-125	
Diethylphthalate	ug/kg	1670	1420	85	67-125	
Dimethylphthalate	ug/kg	1670	1420	85	67-125	
Fluoranthene	ug/kg	1670	1410	85	66-125	
Fluorene	ug/kg	1670	1370	82	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1190	71	40-125	
Hexachlorobenzene	ug/kg	1670	1370	82	62-125	
Hexachloroethane	ug/kg	1670	1190	72	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1450	87	64-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

LABORATORY CONTROL SAMPLE: 2896985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1260	76	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1220	73	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1330	80	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1410	85	65-125	
Naphthalene	ug/kg	1670	1240	74	48-125	
Nitrobenzene	ug/kg	1670	1200	72	48-125	
Pentachlorophenol	ug/kg	1670	1120	67	41-125	
Phenanthrene	ug/kg	1670	1350	81	66-125	
Phenol	ug/kg	1670	1210	73	46-125	
Pyrene	ug/kg	1670	1460	88	69-125	
2,4,6-Tribromophenol (S)	%			76	60-125	
2-Fluorobiphenyl (S)	%			68	30-132	
2-Fluorophenol (S)	%			61	40-125	
Nitrobenzene-d5 (S)	%			59	43-125	
p-Terphenyl-d14 (S)	%			82	62-125	
Phenol-d6 (S)	%			63	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896986 2896987

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427642001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	2130	2140	1630	1720	77	81	30-127	5	30	
1,2-Dichlorobenzene	ug/kg	ND	2130	2140	1610	1550	76	73	30-125	3	30	
1,2-Diphenylhydrazine	ug/kg	ND	2130	2140	1560	1800	73	84	30-150	15	30	
1,3-Dichlorobenzene	ug/kg	ND	2130	2140	1570	1470	74	69	30-125	7	30	
1,4-Dichlorobenzene	ug/kg	ND	2130	2140	1570	1500	74	70	30-125	5	30	
1-Methylnaphthalene	ug/kg	ND	2130	2140	1740	1900	81	89	42-125	9	30	
2,4,5-Trichlorophenol	ug/kg	ND	2130	2140	1690	1950	80	91	30-150	14	30	
2,4,6-Trichlorophenol	ug/kg	ND	2130	2140	1750	1990	82	93	30-150	13	30	
2,4-Dichlorophenol	ug/kg	ND	2130	2140	1820	1980	85	93	30-135	8	30	
2,4-Dimethylphenol	ug/kg	ND	2130	2140	1770	1930	83	90	30-148	9	30	
2,4-Dinitrophenol	ug/kg	ND	2130	2140	ND	ND	0	0	30-125		30	M1
2,4-Dinitrotoluene	ug/kg	ND	2130	2140	1630	1760	77	82	30-150	7	30	
2,6-Dinitrotoluene	ug/kg	ND	2130	2140	1630	1820	77	85	30-150	11	30	
2-Chloronaphthalene	ug/kg	ND	2130	2140	1700	1930	80	90	30-138	13	30	
2-Chlorophenol	ug/kg	ND	2130	2140	1680	1720	79	80	30-130	2	30	
2-Methylnaphthalene	ug/kg	ND	2130	2140	1700	1860	79	87	46-125	9	30	
2-Methylphenol(o-Cresol)	ug/kg	ND	2130	2140	1720	1840	81	86	30-133	6	30	
2-Nitroaniline	ug/kg	ND	2130	2140	1830	2180	86	102	30-150	17	30	
2-Nitrophenol	ug/kg	ND	2130	2140	1360	1410	64	66	30-134	4	30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	2130	2140	1740	1870	82	88	30-138	7	30	
3,3'-Dichlorobenzidine	ug/kg	ND	2130	2140	1780	1880	84	88	30-149	5	30	
3-Nitroaniline	ug/kg	ND	2130	2140	1680	1930	79	91	30-150	14	30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	2130	2140	259J	ND	12	0	30-133		30	4M, M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896986 2896987												
Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		10427642001	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
4-Bromophenylphenyl ether	ug/kg	ND	2130	2140	1750	1930	82	90	44-125	9	30	
4-Chloro-3-methylphenol	ug/kg	ND	2130	2140	1910	2070	90	97	30-150	8	30	
4-Chloroaniline	ug/kg	ND	2130	2140	996	1070	47	50	30-125	7	30	
4-Chlorophenylphenyl ether	ug/kg	ND	2130	2140	1710	1990	81	93	44-125	15	30	
4-Nitroaniline	ug/kg	ND	2130	2140	1850	2240	87	105	30-150	19	30	
4-Nitrophenol	ug/kg	ND	2130	2140	1520	1800	71	84	30-150	17	30	
Acenaphthene	ug/kg	ND	2130	2140	1610	1840	73	84	40-125	13	30	
Acenaphthylene	ug/kg	ND	2130	2140	1690	1910	79	90	30-150	13	30	
Anthracene	ug/kg	ND	2130	2140	1760	1990	77	88	30-150	13	30	
Benzo(a)anthracene	ug/kg	ND	2130	2140	2080	2270	85	94	30-150	9	30	
Benzo(a)pyrene	ug/kg	ND	2130	2140	1990	2290	81	95	30-150	14	30	
Benzo(b)fluoranthene	ug/kg	ND	2130	2140	2120	2370	83	95	30-150	11	30	
Benzo(g,h,i)perylene	ug/kg	ND	2130	2140	1920	2210	82	95	30-150	14	30	
Benzo(k)fluoranthene	ug/kg	ND	2130	2140	1940	2190	84	95	30-150	12	30	
bis(2-Chloroethoxy)methane	ug/kg	ND	2130	2140	1670	1760	78	83	30-134	6	30	
bis(2-Chloroethyl) ether	ug/kg	ND	2130	2140	1590	1570	75	74	30-125	1	30	
bis(2-Chloroisopropyl) ether	ug/kg	ND	2130	2140	1300	1290	61	61	30-125	0	30	4M
bis(2-Ethylhexyl)phthalate	ug/kg	ND	2130	2140	2220	2540	98	113	30-150	14	30	
Butylbenzylphthalate	ug/kg	ND	2130	2140	2110	2580	97	119	30-150	20	30	
Carbazole	ug/kg	ND	2130	2140	1800	2040	82	93	41-125	12	30	
Chrysene	ug/kg	ND	2130	2140	2040	2290	83	95	30-150	11	30	
Di-n-butylphthalate	ug/kg	ND	2130	2140	1880	2150	88	101	30-150	14	30	
Di-n-octylphthalate	ug/kg	ND	2130	2140	2090	2370	98	111	30-150	13	30	
Dibenz(a,h)anthracene	ug/kg	ND	2130	2140	1870	2110	88	99	30-150	12	30	
Dibenzofuran	ug/kg	ND	2130	2140	1720	1980	80	92	45-125	14	30	
Diethylphthalate	ug/kg	ND	2130	2140	1760	2070	83	97	30-150	16	30	
Dimethylphthalate	ug/kg	ND	2130	2140	1800	2040	85	96	30-150	12	30	
Fluoranthene	ug/kg	565	2130	2140	2230	2380	78	85	30-150	7	30	
Fluorene	ug/kg	ND	2130	2140	1710	1950	78	89	30-150	13	30	
Hexachloro-1,3-butadiene	ug/kg	ND	2130	2140	1600	1620	75	76	30-128	2	30	
Hexachlorobenzene	ug/kg	ND	2130	2140	1760	1950	83	91	30-150	10	30	
Hexachloroethane	ug/kg	ND	2130	2140	642	673	30	32	30-125	5	30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	2130	2140	1930	2210	84	97	30-150	14	30	
Isophorone	ug/kg	ND	2130	2140	1650	1750	78	82	30-140	6	30	
N-Nitroso-di-n-propylamine	ug/kg	ND	2130	2140	1610	1670	76	78	30-147	3	30	
N-Nitrosodimethylamine	ug/kg	ND	2130	2140	1640	1450	77	68	30-125	12	30	
N-Nitrosodiphenylamine	ug/kg	ND	2130	2140	1810	2020	85	94	30-150	11	30	
Naphthalene	ug/kg	ND	2130	2140	1660	1730	78	81	44-125	4	30	
Nitrobenzene	ug/kg	ND	2130	2140	1600	1640	75	77	30-136	2	30	
Pentachlorophenol	ug/kg	ND	2130	2140	1430	1530	67	72	30-150	7	30	
Phenanthrene	ug/kg	ND	2130	2140	1800	2050	67	79	30-150	13	30	
Phenol	ug/kg	ND	2130	2140	1600	1720	75	81	30-129	7	30	
Pyrene	ug/kg	511	2130	2140	2370	2530	87	95	30-150	7	30	
2,4,6-Tribromophenol (S)	%						69	80	60-125			
2-Fluorobiphenyl (S)	%						49	53	30-132			
2-Fluorophenol (S)	%						63	59	40-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Parameter	Units	2896986		2896987		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.	10427642001				57	54	43-125			
p-Terphenyl-d14 (S)	%.					76	86	62-125			
Phenol-d6 (S)	%.					64	65	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533341 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2897115 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/20/18 12:15	
Acenaphthylene	ug/kg	ND	10.0	04/20/18 12:15	
Anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(a)anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(a)pyrene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/20/18 12:15	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Chrysene	ug/kg	ND	10.0	04/20/18 12:15	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/20/18 12:15	
Fluoranthene	ug/kg	ND	10.0	04/20/18 12:15	
Fluorene	ug/kg	ND	10.0	04/20/18 12:15	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/20/18 12:15	
Naphthalene	ug/kg	ND	10.0	04/20/18 12:15	
Phenanthrene	ug/kg	ND	10.0	04/20/18 12:15	
Pyrene	ug/kg	ND	10.0	04/20/18 12:15	
2-Fluorobiphenyl (S)	%	72	42-125	04/20/18 12:15	
p-Terphenyl-d14 (S)	%	88	57-125	04/20/18 12:15	

LABORATORY CONTROL SAMPLE: 2897116

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	25.3	76	52-125	
Acenaphthylene	ug/kg	33.3	24.9	75	50-125	
Anthracene	ug/kg	33.3	26.9	81	65-125	
Benzo(a)anthracene	ug/kg	33.3	29.0	87	60-125	
Benzo(a)pyrene	ug/kg	33.3	27.9	84	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	30.3	91	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	29.6	89	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	30.6	92	67-125	
Chrysene	ug/kg	33.3	30.1	90	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	30.5	92	63-125	
Fluoranthene	ug/kg	33.3	29.5	88	75-125	
Fluorene	ug/kg	33.3	25.5	77	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	30.0	90	63-125	
Naphthalene	ug/kg	33.3	24.8	75	49-125	
Phenanthrene	ug/kg	33.3	27.8	83	65-125	
Pyrene	ug/kg	33.3	28.2	85	64-125	
2-Fluorobiphenyl (S)	%			76	42-125	
p-Terphenyl-d14 (S)	%			89	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Parameter	Units	2897117		2897118		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Acenaphthene	ug/kg	49.1	46	46.2	130	103	177	117	30-125	24	30 M1
Acenaphthylene	ug/kg	ND	46	46.2	37.4	38.8	81	84	30-133	4	30
Anthracene	ug/kg	94.1	46	46.2	96.2	163	4	149	30-150	51	30 M1,R1
Benzo(a)anthracene	ug/kg	660	46	46.2	111	85.5	-1190	-1250	30-150	25	30 M1
Benzo(a)pyrene	ug/kg	680	46	46.2	109	79.9	-1240	-1300	30-150	31	30 M1,R1
Benzo(b)fluoranthene	ug/kg	879	46	46.2	138	101	-1610	-1690	30-150	31	30 M1,R1
Benzo(g,h,i)perylene	ug/kg	358	46	46.2	81.6	66.3	-599	-632	30-150	21	30 M1
Benzo(k)fluoranthene	ug/kg	293	46	46.2	75.1	59.2	-473	-507	30-150	24	30 M1
Chrysene	ug/kg	570	46	46.2	112	101	-996	-1020	30-150	10	30 M1
Dibenz(a,h)anthracene	ug/kg	88.8	46	46.2	49.0	45.5	-86	-94	30-131	7	30 M1
Fluoranthene	ug/kg	1040	46	46.2	241	169	-1720	-1880	30-150	35	30 M1,R1
Fluorene	ug/kg	43.3	46	46.2	96.7	112	116	148	30-147	14	30 M1
Indeno(1,2,3-cd)pyrene	ug/kg	308	46	46.2	71.6	62.1	-514	-534	30-150	14	30 M1
Naphthalene	ug/kg	106	46	46.2	222	190	252	182	30-131	16	30 M1
Phenanthrene	ug/kg	318	46	46.2	240	256	-169	-135	30-150	6	30 M1
Pyrene	ug/kg	872	46	46.2	191	139	-1480	-1590	30-150	32	30 M1,R1
2-Fluorobiphenyl (S)	%.						81	83	42-125		
p-Terphenyl-d14 (S)	%.						82	90	57-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

QC Batch: 533572 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2898368 Matrix: Solid

Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/22/18 12:39	
n-Triacontane (S)	%.	115	50-150	04/22/18 12:39	

LABORATORY CONTROL SAMPLE & LCSD: 2898369

2898370

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	86.0	86.0	107	107	70-120	0	20	
n-Triacontane (S)	%.				115	119	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 439502 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 2030883 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	05/01/18 10:56	

LABORATORY CONTROL SAMPLE: 2030884

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	994	907	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030886 2030887

Parameter	Units	60268827001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	1240	1220	1210	1170	98	95	75-125	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030888 2030889

Parameter	Units	60268827001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chromium, Hexavalent	mg/kg	ND	49.7	49.1	40.0	37.2	81	76	75-125	7	20	

SAMPLE DUPLICATE: 2030885

Parameter	Units	50195327001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 286937 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 1678360 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/25/18 13:16	

LABORATORY CONTROL SAMPLE: 1678361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678362 1678363

Parameter	Units	10427642001		1678362		1678363		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Conc.	MSD Conc.	MS Result	MSD Result					
Cyanide	mg/kg	0.52	3.72	3.72	4.0	4.1	93	97	80-120	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678364 1678365

Parameter	Units	10428096003		1678364		1678365		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Conc.	MSD Conc.	MS Result	MSD Result					
Cyanide	mg/kg	0.45	2.7	2.6	3.5	2.7	112	87	80-120	25	20	M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Solid
Pace Project No.: 10427824

QC Batch: 141337 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10427824001, 10427824002, 10427824003

METHOD BLANK: 559083 Matrix: Solid
Associated Lab Samples: 10427824001, 10427824002, 10427824003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	1.0	04/25/18 23:33	

LABORATORY CONTROL SAMPLE: 559082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	49.8	55.2	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559084 559085

Parameter	Units	10427642003 Result	559084		559085		% Rec	MSD	% Rec	MSD	% Rec	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Fluoride	mg/kg	ND	49.3	49.7	34.2	29.5	69	59	80-120	15	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559086 559087

Parameter	Units	10427642001 Result	559086		559087		% Rec	MSD	% Rec	MSD	% Rec	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Fluoride	mg/kg	ND	50.5	49.3	21.2	19.1	42	39	80-120	10	20	M1	

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427824

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M Sample was black in color and slightly viscous. Sample was centrifuged and decanted prior to analysis.

2M Sample was black in color and viscous. Sample was centrifuged and decanted prior to analysis.

3M Sample was dark brown in color.

4M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

ANALYTE QUALIFIERS

- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
- T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427824001	FD-TT-14 (2' -12' WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427824002	FL-TT-01 (3'-11' WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 1630 (1998)	141683	EPA 1630 (1998)	141685
10427824001	FD-TT-14 (2' -12' WM)	EPA 3550	533317	EPA 8081B	534051
10427824002	FL-TT-01 (3'-11' WM)	EPA 3550	533317	EPA 8081B	534051
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3550	533317	EPA 8081B	534051
10427824001	FD-TT-14 (2' -12' WM)	EPA 3550	533330	EPA 8082A	533720
10427824002	FL-TT-01 (3'-11' WM)	EPA 3550	533330	EPA 8082A	533720
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3550	533330	EPA 8082A	533720
10427824001	FD-TT-14 (2' -12' WM)	WI MOD DRO	533572	WI MOD DRO	533638
10427824002	FL-TT-01 (3'-11' WM)	WI MOD DRO	533572	WI MOD DRO	533638
10427824003	FL-TT-02 (2'-10.5' WM)	WI MOD DRO	533572	WI MOD DRO	533638
10427824001	FD-TT-14 (2' -12' WM)	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10427824002	FL-TT-01 (3'-11' WM)	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10427824001	FD-TT-14 (2' -12' WM)	EPA 3050	533415	EPA 6010C	533499
10427824002	FL-TT-01 (3'-11' WM)	EPA 3050	533415	EPA 6010C	533499
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3050	533415	EPA 6010C	533499
10427824001	FD-TT-14 (2' -12' WM)	EPA 3050B	438855	EPA 6020	439080
10427824002	FL-TT-01 (3'-11' WM)	EPA 3050B	438855	EPA 6020	439080
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3050B	438855	EPA 6020	439080
10427824001	FD-TT-14 (2' -12' WM)	EPA 3050	533412	EPA 6020A	533510
10427824002	FL-TT-01 (3'-11' WM)	EPA 3050	533412	EPA 6020A	533510
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3050	533412	EPA 6020A	533510
10427824001	FD-TT-14 (2' -12' WM)	EPA 7471	533419	EPA 7471	533655
10427824002	FL-TT-01 (3'-11' WM)	EPA 7471	533419	EPA 7471	533655
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 7471	533419	EPA 7471	533655
10427824001	FD-TT-14 (2' -12' WM)	ASTM D2974	534034		
10427824002	FL-TT-01 (3'-11' WM)	ASTM D2974	534034		
10427824003	FL-TT-02 (2'-10.5' WM)	ASTM D2974	534034		
10427824001	FD-TT-14 (2' -12' WM)	EPA 3550	533315	EPA 8270D	533819
10427824002	FL-TT-01 (3'-11' WM)	EPA 3550	533315	EPA 8270D	533819
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3550	533315	EPA 8270D	533819
10427824001	FD-TT-14 (2' -12' WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427824002	FL-TT-01 (3'-11' WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3550	533341	EPA 8270D by SIM	533540
10427824001	FD-TT-14 (2' -12' WM)	EPA 5035/5030B	534992	EPA 8260B	535296
10427824002	FL-TT-01 (3'-11' WM)	EPA 5035/5030B	534992	EPA 8260B	535296
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 5035/5030B	534992	EPA 8260B	535296
10427824001	FD-TT-14 (2' -12' WM)	EPA 3060A	439502	EPA 7196A	439771
10427824002	FL-TT-01 (3'-11' WM)	EPA 3060A	439502	EPA 7196A	439771
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 3060A	439502	EPA 7196A	439771

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Solid

Pace Project No.: 10427824

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427824001	FD-TT-14 (2' -12' WM)	Trivalent Chromium Calculation	440373		
10427824002	FL-TT-01 (3'-11' WM)	Trivalent Chromium Calculation	440373		
10427824003	FL-TT-02 (2'-10.5' WM)	Trivalent Chromium Calculation	440373		
10427824001	FD-TT-14 (2' -12' WM)	EPA 9012A	286937	EPA 9012	286958
10427824002	FL-TT-01 (3'-11' WM)	EPA 9012A	286937	EPA 9012	286958
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 9012A	286937	EPA 9012	286958
10427824001	FD-TT-14 (2' -12' WM)	EPA 300.0	141337	EPA 9056A	141349
10427824002	FL-TT-01 (3'-11' WM)	EPA 300.0	141337	EPA 9056A	141349
10427824003	FL-TT-02 (2'-10.5' WM)	EPA 300.0	141337	EPA 9056A	141349

REPORT OF LABORATORY ANALYSIS

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WO# 10427824



10427824

Minnesota Pollution Control Agency		Work Order Number:				COC Type:				Page: 1 of											
PROJECT/CLIENT INFO		Turnaround Time:				COC ID:				FOR LAB USE ONLY											
LABORATORY		Lab Name:				Address:				Lab Work Order Sticker											
Facility Code:	MPCA - Freeway LF Solids				Program Code (MDH Lab Only):																
Project Name:	MPCA - Freeway LF Solids				Project Task Code:																
Project Manager:					Address:	19-00383															
Potential Hazard?	If yes, add information to Sampler Comments Section				Phone No:	EPIC Profile #39716															
SAMPLE DETAILS						ANALYSIS REQUESTED															
SAMPLE TYPE CODES		LAB MATRIX CODES		FIELD MATRIX CODES		ANALYSIS REQUESTED															
Sample=Routine Sample S-TVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe AR=Air BL=Biological Material OT=Other TS=Tissue		GW=Ground=Groundwater SW=Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		ANALYSIS REQUESTED PRESERV. ANALYSIS SEE ATTACHED FOR SOILS/WASTE (-DIAGNOSIS) + DIAGNOSIS													
Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	LABORATORY	Lab Sample No.	#
EP-11-14 (2-12 WM)	S	4/18/18	9:10	2'	12'	C	SD	WM			13	X	X							001	1
EP-11-01 (2-11 WM)	S	4/18/18	12:30	3'	11'	C	SD	WM			13	X	X							002	2
EP-11-02 (2-10.5 WM)	S	4/18/18	13:50	2'	10.5'	C	SD	WM			13	X	X							003	3
No. 11 4/18/18																					
Sampled By: Nate Hibbard										Sampler's Signature: <i>Nate Hibbard</i>										Phone #: 612-214-9066	
Receiving Comments:																					
Relinquished By/Affiliation										Accepted By/Affiliation											
(Sampler) <i>Nate Hibbard / Pace</i>										<i>Woot Pa-ee</i>											
Date/Time										Date/Time											
4/18/18 1730										4/18/18 1730											
1730 T=7.3																					

Sample Condition Upon Receipt	Client Name: <u>MPCA</u>	Project #: WO# : 10427824
Courier: <input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pace <input type="checkbox"/> SpeeDee <input type="checkbox"/> Other: _____	PM: JMA Due Date: 05/03/18 CLIENT: PMSI-MNFLD	
Tracking Number: _____		

Custody Seal on Cooler/Box Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Seals Intact? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Optional: Proj. Due Date: Proj. Name:
Packing Material: <input type="checkbox"/> Bubble Wrap <input type="checkbox"/> Bubble Bags <input checked="" type="checkbox"/> None <input type="checkbox"/> Other: _____	Temp Blank? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Thermometer <input type="checkbox"/> 151401163 Used: <input checked="" type="checkbox"/> G87A9155100842	Type of Ice: <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Blue <input type="checkbox"/> None <input type="checkbox"/> Dry <input type="checkbox"/> Melted	
Cooler Temp Read (°C): <u>7.1</u> Cooler Temp Corrected (°C): <u>7.3</u>	Biological Tissue Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Temp should be above freezing to 6°C Correction Factor: <u>+0.2</u> Date and Initials of Person Examining Contents: <u>MD 4/18/18</u>		
USDA Regulated Soil (<input type="checkbox"/> N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.		

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>No times on samples</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION		Field Data Required? <input type="checkbox"/> Yes <input type="checkbox"/> No
Person Contacted: _____	Date/Time: _____	
Comments/Resolution: _____		

Project Manager Review: <u>[Signature]</u>	Date: <u>04/19/2018</u>
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).	

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (needed for Cr III calc)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN

Project #:

WO# : 12107384
 PM: HRZ Due Date: 05/02/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.1 Cooler Temp Corrected °C: 5.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 4-20-18 DC

Comments: Brn 4/20/18

Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Cavin Jones Date: 4/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

4016 7737

65 of 83



[Handwritten Signature]

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427824 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To		Subcontract To					Requested Analysis																																																																		
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436					<table border="1"> <tr> <th>Unpreserved</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>															Unpreserved																																																			
Unpreserved																																																																									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers																LAB USE ONLY																																																			
1	FD-TT-14 (2' -12' WM)	PS	4/18/2018 09:10	10427824001	Solid	1																																																																			
2	FL-TT-01 (3'-11' WM)	PS	4/18/2018 12:30	10427824002	Solid	1																																																																			
3	FL-TT-02 (2'-10.5' WM)	PS	4/18/2018 13:50	10427824003	Solid	1																																																																			
4																																																																									
5																																																																									

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/18/18	<i>[Signature]</i>		
2	Walt CO	4/18/18 08:30	DR Smith, pale	4/18/18 08:40	
3					

Cooler Temperature on Receipt 35 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

001
002
003

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Preservation Receipt Form

Client Name: Pace NW

Project # 40167737

All containers needing preservation have been checked and noted below: Yes No N/A

Lab Lot# of pH paper:

Lab Std #ID of preservation (if pH adjusted):


Initial when completed:

Date/Time:

Pace Lab #	Glass							Plastic						Vials					Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)					
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T								ZPLC	GN			
001																																				
002																																				2.5 / 5 / 10
003																																				2.5 / 5 / 10
004																																				2.5 / 5 / 10
005																																				2.5 / 5 / 10
006																																				2.5 / 5 / 10
007																																				2.5 / 5 / 10
008																																				2.5 / 5 / 10
009																																				2.5 / 5 / 10
010																																				2.5 / 5 / 10
011																																				2.5 / 5 / 10
012																																				2.5 / 5 / 10
013																																				2.5 / 5 / 10
014																																				2.5 / 5 / 10
015																																				2.5 / 5 / 10
016																																				2.5 / 5 / 10
017																																				2.5 / 5 / 10
018																																				2.5 / 5 / 10
019																																				2.5 / 5 / 10
020																																				2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : Yes No N/A ***If yes look in headspace column**

AG1U 1 liter amber glass	BP1U 1 liter plastic unpres	DG9A 40 mL amber ascorbic	JGFU 4 oz amber jar unpres
AG1H 1 liter amber glass HCL	BP2N 500 mL plastic HNO3	DG9T 40 mL amber Na Thio	WGFU 4 oz clear jar unpres
AG4S 125 mL amber glass H2SO4	BP2Z 500 mL plastic NaOH, Znact	VG9U 40 mL clear vial unpres	WPFU 4 oz plastic jar unpres
AG4U 120 mL amber glass unpres	BP3U 250 mL plastic unpres	VG9H 40 mL clear vial HCL	
AG5U 100 mL amber glass unpres	BP3C 250 mL plastic NaOH	VG9M 40 mL clear vial MeOH	SP5T 120 mL plastic Na Thiosulfate
AG2S 500 mL amber glass H2SO4	BP3N 250 mL plastic HNO3	VG9D 40 mL clear vial DI	ZPLC ziploc bag
BG3U 250 mL clear glass unpres	BP3S 250 mL plastic H2SO4		GN:

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace MN
Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

Tracking #: 1697357


Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no
Custody Seal on Samples Present: yes no **Seals intact:** yes no

Packing Material: Bubble Wrap Bubble Bags None Other
Thermometer Used: SR - 66 **Type of Ice:** Wet Blue Dry None

Cooler Temperature: Uncorr: 3 ICorr: 3.5 Samples on ice, cooling process has begun

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Project #: **WO# : 40167737**

 40167737

Person examining contents:
 Date: 4/20/18
 Initials: RS

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRWU RS 4/20/18</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>002+003 no collect times on client labels RS 4/20/18</u>
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: Cee **Date:** 4/20/18

Chain of Custody

WO#: 12107384
 PM: HRZ Due Date: 05/04/18
 CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427824 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/18/2018 Requested By: 5/3/2018

Report To		Subcontract To				Requested Analysis											
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380															
						Preserved Containers					Methyl Mercury by 1630					LAB USE ONLY	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved											
1	FD-TT-14 (2' -12' WM)	PS	4/18/2018 09:10	10427824001	Solid	1											
2	FL-TT-01 (3'-11' WM)	PS	4/18/2018 12:30	10427824002	Solid	1											
3	FL-TT-02 (2'-10.5' WM)	PS	4/18/2018 13:50	10427824003	Solid	1											
4																	
5																	
															Comments		
Transfers	Released By	Date/Time	Received By	Date/Time													
1	<i>[Signature]</i>	4/19/18 17:20	<i>[Signature]</i>	4-19-18 19:30													
2	<i>[Signature]</i>	4-19-18 22:15	<i>[Signature]</i>	4/20/18 08:00													
3																	
Cooler Temperature on Receipt		4.0 °C	Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N										

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: PACE MPLS Project #: _____

WO#: 12107384

PM: HRZ Due Date: 05/04/18

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 01339252/1710 IR-1 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 4.0 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.0 Date and Initials of Person Examining Contents: 4/20/18 

If temperature is ≤0°C, is there evidence of ice formation? Yes No NA

	Comments:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation will be checked and documented in the pH logbook. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

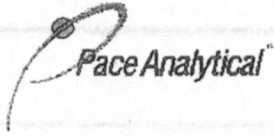
Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194907

Date/Time and Initials of person examining contents: JH 4-20-18 953

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 0832 2530

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 120456ABCDEF Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2.2/2.5 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

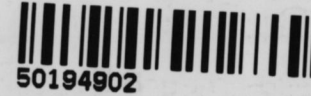
All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		X	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			X
Chain of Custody Present:	X	X ^{JH 4-20-18}	Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	X	X ^{JH 4-20-18}	Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: Analysis:		X	Headspace Wisconsin Sulfide			X
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):			X
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		X	

Comments:

Sample Container Count

WO#: 50194902



CLIENT: Pace MN

COC PAGE ___ of ___

COC ID# _____

Project # 50194902

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Bul Kit	Matrix (Soil/W Aqueo)	pH <2	pH >9	pH >1		
																								Matrix (Soil/W Aqueo)	pH <2
1																					SL				
2																						SL			
3																						SL			
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Page 72 of 83



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 28, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/20/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427824
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-14 (2'-12' WM) (10427824001)	A181624-01	Solid	04/18/2018	04/20/2018
FL-TT-01 (3'-11' WM) (10427824002)	A181624-02	Solid	04/18/2018	04/20/2018
FL-TT-02 (2'-10.5' WM) (10427824003)	A181624-03	Solid	04/18/2018	04/20/2018

CASE NARRATIVE

Sample Receipt Information:

3 samples were received on 04/20/2018. Samples were received at 2.3 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10427824
 Project Manager: Jennifer Anderson

FD-TT-14 (2'-12' WM) (10427824001)

A181624-01 (Solid)

Date Sampled
04/18/2018 09:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804178

2,4-D	0.17	0.10	mg/kg dry	1	04/22/2018	04/23/2018 03:34	EPA 8321B	P
2,4-DB	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:18	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:18	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:18	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:18	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 03:34	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 03:34	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 04:18	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/22/2018	04/23/2018 03:34	EPA 8321B	

Surrogate: DCAA 85.3 % 70.8-116 04/22/2018 04/23/2018 03:34 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	75.5	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427824
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

Blank (A804178-BLK1)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 20:52										
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	19.9		mg/kg wet	20.00		99.7	70.8-116			
Surrogate: DCAA [2C]	17.9		mg/kg wet	20.00		89.4	62.3-114			

LCS (A804178-BS1)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 19:45										
2,4-D	1.89	0.10	mg/kg wet	2.000		94.5	81.6-107			
2,4-D [2C]	1.73	0.10	mg/kg wet	2.000		86.5	71.8-120			
2,4-DB	1.77	0.10	mg/kg wet	2.000		88.7	76.4-107			
2,4-DB [2C]	1.66	0.10	mg/kg wet	2.000		82.9	62.2-129			
2,4,5-T	1.96	0.10	mg/kg wet	2.000		98.0	81.2-110			
2,4,5-T [2C]	1.87	0.10	mg/kg wet	2.000		93.6	70.6-125			
2,4,5-TP	1.86	0.10	mg/kg wet	2.000		92.8	79.1-106			
2,4,5-TP [2C]	1.74	0.10	mg/kg wet	2.000		86.9	68.2-118			
Bentazon	1.02	0.10	mg/kg wet	1.000		102	82.5-119			
Bentazon [2C]	0.877	0.10	mg/kg wet	1.000		87.7	73.3-125			
Dicamba	1.93	0.10	mg/kg wet	2.000		96.3	85.1-108			
Dicamba [2C]	1.83	0.10	mg/kg wet	2.000		91.4	71.4-115			
Picloram	0.978	0.10	mg/kg wet	1.000		97.8	86.1-106			
Picloram [2C]	0.846	0.10	mg/kg wet	1.000		84.6	74.5-114			
Triclopyr	1.86	0.10	mg/kg wet	2.000		92.9	78.6-106			
Triclopyr [2C]	1.71	0.10	mg/kg wet	2.000		85.6	69.4-118			
Surrogate: DCAA	19.8		mg/kg wet	20.00		98.9	70.8-116			
Surrogate: DCAA [2C]	18.3		mg/kg wet	20.00		91.7	62.3-114			

LCS (A804178-BS2)										
Prepared: 04/22/2018 Analyzed: 04/22/2018 18:37										
MCPA	2.14	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	1.92	0.10	mg/kg wet	2.000		95.9	77-123			



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Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427824
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

LCS (A804178-BS2)

Prepared: 04/22/2018 Analyzed: 04/22/2018 18:37

Surrogate: DCAA	19.9		mg/kg wet	20.00		99.4	70.8-116			
Surrogate: DCAA [2C]	20.2		mg/kg wet	20.00		101	62.3-114			

Matrix Spike (A804178-MS1)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/22/2018 23:06

2,4-D	2.05	0.10	mg/kg dry	2.490	ND	82.5	71.4-105			
2,4-D [2C]	1.94	0.10	mg/kg dry	2.490	0.220	69.1	50.5-123			
2,4-DB	1.91	0.10	mg/kg dry	2.490	0.0501	74.6	46.4-117			
2,4-DB [2C]	1.76	0.10	mg/kg dry	2.490	0.252	60.6	44.5-121			
2,4,5-T	2.16	0.10	mg/kg dry	2.490	ND	86.8	66.2-110			
2,4,5-T [2C]	1.87	0.10	mg/kg dry	2.490	ND	75.2	43.6-126			
2,4,5-TP	2.01	0.10	mg/kg dry	2.490	0.199	72.7	52.4-114			
2,4,5-TP [2C]	1.61	0.10	mg/kg dry	2.490	0.219	55.8	47.6-117			
Bentazon	1.13	0.10	mg/kg dry	1.245	ND	91.0	61.5-117			
Bentazon [2C]	1.20	0.10	mg/kg dry	1.245	ND	96.2	50.7-127			
Dicamba	1.71	0.10	mg/kg dry	2.490	ND	68.7	48.4-111			
Dicamba [2C]	1.86	0.10	mg/kg dry	2.490	0.290	63.1	43.3-108			
Picloram	0.654	0.10	mg/kg dry	1.245	ND	52.6	26.7-110			
Picloram [2C]	0.505	0.10	mg/kg dry	1.245	ND	40.6	10.8-110			
Triclopyr	2.16	0.10	mg/kg dry	2.490	0.182	79.6	56-113			
Triclopyr [2C]	1.70	0.10	mg/kg dry	2.490	0.211	60.0	47.9-120			
Surrogate: DCAA	21.6		mg/kg dry	24.89		86.8	70.8-116			
Surrogate: DCAA [2C]	20.6		mg/kg dry	24.89		82.8	62.3-114			

Matrix Spike (A804178-MS2)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/23/2018 01:20

MCPA	2.29	0.10	mg/kg dry	2.490	ND	92.0	74.2-114			
MCPA [2C]	2.16	0.10	mg/kg dry	2.490	ND	86.7	60.9-122			
Surrogate: DCAA	21.5		mg/kg dry	24.89		86.2	70.8-116			
Surrogate: DCAA [2C]	22.0		mg/kg dry	24.89		88.3	62.3-114			

Matrix Spike Dup (A804178-MSD1)

Source: A181624-02

Prepared: 04/22/2018 Analyzed: 04/23/2018 00:13

2,4-D	2.10	0.10	mg/kg dry	2.490	ND	84.3	71.4-105	2.19	20	
2,4-D [2C]	2.24	0.10	mg/kg dry	2.490	0.220	81.2	50.5-123	14.4	20	
2,4-DB	1.94	0.10	mg/kg dry	2.490	0.0501	76.1	46.4-117	1.91	20	
2,4-DB [2C]	1.82	0.10	mg/kg dry	2.490	0.252	63.2	44.5-121	3.63	20	
2,4,5-T	2.13	0.10	mg/kg dry	2.490	ND	85.4	66.2-110	1.61	20	
2,4,5-T [2C]	1.69	0.10	mg/kg dry	2.490	ND	67.7	43.6-126	10.5	20	
2,4,5-TP	1.97	0.10	mg/kg dry	2.490	0.199	71.0	52.4-114	2.17	20	
2,4,5-TP [2C]	1.69	0.10	mg/kg dry	2.490	0.219	59.2	47.6-117	5.02	20	
Bentazon	1.13	0.10	mg/kg dry	1.245	ND	90.5	61.5-117	0.559	20	
Bentazon [2C]	1.21	0.10	mg/kg dry	1.245	ND	96.9	50.7-127	0.794	20	
Dicamba	1.70	0.10	mg/kg dry	2.490	ND	68.5	48.4-111	0.297	20	
Dicamba [2C]	2.04	0.10	mg/kg dry	2.490	0.290	70.2	43.3-108	9.07	20	
Picloram	0.591	0.10	mg/kg dry	1.245	ND	47.5	26.7-110	10.2	20	
Picloram [2C]	0.569	0.10	mg/kg dry	1.245	ND	45.7	10.8-110	11.8	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Solid - MN Project Number: 10427824 Project Manager: Jennifer Anderson
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Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804178 - EPA 3570

Matrix Spike Dup (A804178-MSD1)		Source: A181624-02			Prepared: 04/22/2018 Analyzed: 04/23/2018 00:13					
Triclopyr	2.16	0.10	mg/kg dry	2.490	0.182	79.6	56-113	0.0287	20	
Triclopyr [2C]	2.10	0.10	mg/kg dry	2.490	0.211	76.0	47.9-120	20.9	20	X
Surrogate: DCAA	21.7		mg/kg dry	24.89		87.1	70.8-116			
Surrogate: DCAA [2C]	20.6		mg/kg dry	24.89		82.8	62.3-114			
Matrix Spike Dup (A804178-MSD2)		Source: A181624-02			Prepared: 04/22/2018 Analyzed: 04/23/2018 02:27					
MCPA	2.35	0.10	mg/kg dry	2.490	ND	94.2	74.2-114	2.42	20	
MCPA [2C]	2.47	0.10	mg/kg dry	2.490	ND	99.2	60.9-122	13.5	20	
Surrogate: DCAA	21.5		mg/kg dry	24.89		86.3	70.8-116			
Surrogate: DCAA [2C]	23.4		mg/kg dry	24.89		94.0	62.3-114			



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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804195 - % Solids

Duplicate (A804195-DUP1)	Source: A181708-01		Prepared: 04/25/2018 Analyzed: 04/27/2018 09:07							
% Solids	79.2	0.00	% by Weight		79.6			0.516	20	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10427824
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- P The difference in the concentrations between the primary and confirmation column was > 40%.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181624



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427824 Workorder Name: 18-00383 MPCA-Freeway LF Solid Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To		Subcontract To						Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					MDA List II											LAB USE ONLY
						Unpreserved																
1	FD-TT-14 (2' -12' WM)	PS	4/18/2018 09:10	10427824001	Solid	1						X										01
2	FL-TT-01 (3'-11' WM)	PS	4/18/2018 12:30	10427824002	Solid	1						X										02
3	FL-TT-02 (2'-10.5' WM)	PS	4/18/2018 13:50	10427824003	Solid	1						X										03
4																						
5																						
Transfers												Comments										
	Released By	Date/Time	Received By	Date/Time																		
1	<i>Kay Sud Pace</i>	4/19/18 16:20	<i>Kari Ann Hill</i>	4/20/18																		
2				10:08																		
3																						
Cooler Temperature on Receipt 2.3 °C			Custody Seal Y or N			Received on Ice Y or N			Samples Intact Y or N													

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp. 7/12/18

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

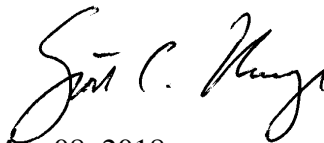
PaceProject#: 10428092
Sample Receipt Date: 04/20/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 08, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 8, 2018

DISCUSSION

This report presents the results from the analyses performed on five samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 56-78%. All of the labeled internal standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 118%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10428092

Appendix A

Sample Management



		Chain-of-Custody Form		Work Order Number:		COC Type:		Page: 1 of 1						
PROJECT/CLIENT INFO				LABORATORY				FOR LAB USE ONLY						
Facility Code: MNSW057/MPCA Freeway LF Solids		Program Code: (MDH Lab Only)		Lab Name:		Address: 18-CO383		Lab Work Order Sticker						
Project Name: MPCA - Freeway LF Solids		Project Task Code:		Address: 18-CO383		Phone No: EPIC Profile #38716								
Project Manager:		Potential Hazard?: If yes, add information to Sampler Comments Section												
SAMPLE DETAILS					ANALYSIS REQUESTED									
SAMPLE TYPE CODES S-Routine Sample S-IVP Integrated Vertical Profile Sample S-CWOP Composite Sample		QC CODES QC-FB Field Blank Sample QC-FR Field Replicate Sample QC-TB Trip Blank Sample		LAB MATRIX CODES DW-Drinking Water NW-Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air SL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES GW-Ground=Groundwater SW-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		ANALYSIS				
Location Identifier	Sample Type	Date	Time	Start Depth, Fm meters	End Depth, Fm meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	Lab Sample No.	#
FL-TT-03 (2-10)WM	S	4/19/18	0900	2	10	C	SD				13	X	001	1
FL-TT-06 (0-10)S	S	4/19/18	1145	0	10	C	SD				13	X	002	2
FL-TT-04 (2-14)WM	S	4/19/18	1230	2	14	C	SD				13	X	003	3
FL-TT-05 (5-15)WM	S	4/19/18	1500	5	15	C	SD				13	X	004	4
FL-TT-07 (1-5)S	S	4/19/18	1715	1	5	C	SD				13	X	005	5
B.C. 4/20/18														
Sampled By: Brad Jacobson/SAR/TJB				Sampler's Signature: <i>Brad Jacobson</i>				Phone #: 612-570-8276						
Receiving Comments:														
Relinquished By/Affiliation					Date/Time					Accepted By/Affiliation				
(Sampler) <i>JTO</i>					4-20-18/030					[Signature] MACE 4-20-18 830				

3692

Sample Condition Upon Receipt **Client Name:** Minnesota Pollution Control Agency **Project #:** _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

WO# : 10428092

PM: SCU **Due Date: 05/04/18**
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 3.6 **Cooler Temp Corrected (°C):** 3.6 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** H 4-20-18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 04/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10428092

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-03 (2-10)WM		
Lab Sample ID	10428092001		
Filename	U180504B_04		
Injected By	BAL		
Total Amount Extracted	14.7 g	Matrix	Solid
% Moisture	71.2	Dilution	NA
Dry Weight Extracted	4.23 g	Collected	04/19/2018 09:00
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180504A_16 & U180504B_15	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 20:20

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	4.3	----	1.0	2,3,7,8-TCDD-13C	2.00	64
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	63

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-06 (0-10)S		
Lab Sample ID	10428092002		
Filename	U180504B_05		
Injected By	BAL		
Total Amount Extracted	14.0 g	Matrix	Solid
% Moisture	25.3	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	04/19/2018 11:45
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180504A_16 & U180504B_15	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 21:08

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	72
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	68

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-04 (2-14)WM		
Lab Sample ID	10428092003		
Filename	U180504A_04		
Injected By	SMT		
Total Amount Extracted	13.3 g	Matrix	Solid
% Moisture	26.1	Dilution	NA
Dry Weight Extracted	9.83 g	Collected	04/19/2018 12:30
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503B_16 & U180504A_16	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 07:22

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.4	----	1.0	2,3,7,8-TCDD-13C	2.00	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	61

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-05 (5-15)WM		
Lab Sample ID	10428092004		
Filename	U180504A_05		
Injected By	SMT		
Total Amount Extracted	15.7 g	Matrix	Solid
% Moisture	35.6	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	04/19/2018 15:00
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503B_16 & U180504A_16	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 08:10

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	78
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	81

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

E = Exceeds calibration range

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Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-07 (1-5)S		
Lab Sample ID	10428092005		
Filename	U180504A_06		
Injected By	SMT		
Total Amount Extracted	12.3 g	Matrix	Solid
% Moisture	48.2	Dilution	NA
Dry Weight Extracted	6.37 g	Collected	04/19/2018 17:15
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503B_16 & U180504A_16	Extracted	04/25/2018 15:05
Method Blank ID	BLANK-61942	Analyzed	05/04/2018 08:58

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	4.3	----	1.0	2,3,7,8-TCDD-13C	2.00	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	54

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61942	Matrix	Solid
Filename	F180502B_07	Dilution	NA
Total Amount Extracted	75.5 g	Extracted	04/25/2018 15:05
ICAL ID	F180405	Analyzed	05/02/2018 16:51
CCal Filename(s)	F180502B_01 & F180502B_17	Injected By	SMT

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61943	Matrix	Solid
Filename	F180502B_16	Dilution	NA
Total Amount Extracted	75.6 g	Extracted	04/25/2018 15:05
ICAL ID	F180405	Analyzed	05/02/2018 23:37
CCal Filename(s)	F180502B_01 & F180502B_17	Injected By	SMT
Method Blank ID	BLANK-61942		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.24	118	2,3,7,8-TCDD-13C	2.0	59
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	62

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 08, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1382680

Nevada DCNR Certification #: MN000372018-1
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

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CERTIFICATIONS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10428096001	FL-TT-03(2-10) WM	Solid	04/19/18 09:00	04/20/18 08:30
10428096002	FL-TT-06 (0-10) S	Solid	04/19/18 11:45	04/20/18 08:30
10428096003	FL-TT-04 (2-14) WM	Solid	04/19/18 12:30	04/20/18 08:30
10428096004	FL-TT-05 (5-15) WM	Solid	04/19/18 15:00	04/20/18 08:30
10428096005	FL-TT-07 (1-5) S	Solid	04/19/18 17:15	04/20/18 08:30

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10428096001	FL-TT-03(2-10) WM	EPA 1630 (1998)	CPK	1	PASI-DUL		
		EPA 8081B	XV1	24	PASI-M		
		EPA 8082A	RAG	12	PASI-M		
		WI MOD DRO	JRH	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010C	DM	11	PASI-M		
		EPA 6020	DMT	1	PASI-I		
		EPA 6020A	TT3	10	PASI-M		
		EPA 7471	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D	AT1	72	PASI-M		
		EPA 8270D by SIM	STB	18	PASI-M		
		EPA 8260B	CD2	70	PASI-M		
		EPA 7196A	JRB	1	PASI-I		
		Trivalent Chromium Calculation	SLB	1	PASI-I		
		EPA 9012	DAW	1	PASI-G		
		EPA 9056A	MCT	1	PASI-V		
		10428096002	FL-TT-06 (0-10) S	EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M
WI MOD DRO	JRH			2	PASI-M		
WI MOD GRO	AJR			2	PASI-M		
EPA 6010C	DM			11	PASI-M		
EPA 6020	DMT			1	PASI-I		
EPA 6020A	TT3			10	PASI-M		
EPA 7471	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D	AT1			72	PASI-M		
EPA 8270D by SIM	STB			18	PASI-M		
EPA 8260B	CD2			70	PASI-M		
EPA 7196A	JRB			1	PASI-I		
Trivalent Chromium Calculation	SLB			1	PASI-I		
EPA 9012	DAW			1	PASI-G		
EPA 9056A	MCT			1	PASI-V		
10428096003	FL-TT-04 (2-14) WM			EPA 1630 (1998)	CPK	1	PASI-DUL
				EPA 8081B	XV1	24	PASI-M
				EPA 8082A	RAG	12	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	PW1	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10428096004	FL-TT-05 (5-15) WM	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	PW1	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V
10428096005	FL-TT-07 (1-5) S	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	PW1	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	SLB	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM Lab ID: 10428096001 Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	29.1	ng/g	24.0	1	05/04/18 10:07	05/07/18 14:03	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	309-00-2	
alpha-BHC	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	319-84-6	
beta-BHC	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	319-85-7	
delta-BHC	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	319-86-8	
gamma-BHC (Lindane)	102	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	58-89-9	
Chlordane (Technical)	ND	ug/kg	231	2	04/20/18 16:36	05/01/18 21:45	57-74-9	
alpha-Chlordane	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	5103-71-9	
gamma-Chlordane	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	5103-74-2	
4,4'-DDD	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	72-54-8	
4,4'-DDE	53.4	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	72-55-9	
4,4'-DDT	75.3	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	50-29-3	
Dieldrin	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	60-57-1	
Endosulfan I	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	959-98-8	
Endosulfan II	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	33213-65-9	
Endosulfan sulfate	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	1031-07-8	
Endrin	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	72-20-8	
Endrin aldehyde	ND	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	7421-93-4	
Endrin ketone	355	ug/kg	46.1	2	04/20/18 16:36	05/01/18 21:45	53494-70-5	
Heptachlor	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	76-44-8	
Heptachlor epoxide	ND	ug/kg	23.1	2	04/20/18 16:36	05/01/18 21:45	1024-57-3	
Methoxychlor	ND	ug/kg	231	2	04/20/18 16:36	05/01/18 21:45	72-43-5	
Toxaphene	ND	ug/kg	692	2	04/20/18 16:36	05/01/18 21:45	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	84	%	30-150	2	04/20/18 16:36	05/01/18 21:45	877-09-8	3M,D4
Decachlorobiphenyl (S)	76	%	30-150	2	04/20/18 16:36	05/01/18 21:45	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11141-16-5	
PCB-1242 (Aroclor 1242)	10500	ug/kg	458	2	04/20/18 16:33	04/27/18 13:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	12672-29-6	
PCB-1254 (Aroclor 1254)	878	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	229	1	04/20/18 16:33	04/24/18 15:10	11100-14-4	
PCB, Total	11300	ug/kg	458	2	04/20/18 16:33	04/27/18 13:36	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	75	%	48-125	1	04/20/18 16:33	04/24/18 15:10	877-09-8	
Decachlorobiphenyl (S)	114	%	30-134	1	04/20/18 16:33	04/24/18 15:10	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	3370	mg/kg	2890	10	04/20/18 17:57	04/22/18 14:26		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM **Lab ID: 10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/20/18 17:57	04/22/18 14:26	638-68-6	P3,S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	33.6	1	05/02/18 10:19	05/02/18 19:36		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	05/02/18 10:19	05/02/18 19:36	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	24900	mg/kg	34.1	1	04/23/18 07:48	04/26/18 13:42	7429-90-5	P6,R1
Barium	428	mg/kg	1.7	1	04/23/18 07:48	04/26/18 13:42	7440-39-3	M1
Boron	109	mg/kg	25.6	1	04/23/18 07:48	04/26/18 13:42	7440-42-8	M1,R1
Copper	448	mg/kg	1.7	1	04/23/18 07:48	04/26/18 13:42	7440-50-8	M1,R1
Iron	166000	mg/kg	85.2	10	04/23/18 07:48	04/26/18 14:39	7439-89-6	M6,R1
Manganese	596	mg/kg	0.85	1	04/23/18 07:48	04/26/18 13:42	7439-96-5	M1
Nickel	62.5	mg/kg	3.4	1	04/23/18 07:48	04/26/18 13:42	7440-02-0	
Silver	26.3	mg/kg	1.7	1	04/23/18 07:48	04/26/18 13:42	7440-22-4	
Tin	406	mg/kg	12.8	1	04/23/18 07:48	04/26/18 13:42	7440-31-5	M1,R1
Titanium	208	mg/kg	4.3	1	04/23/18 07:48	04/26/18 13:42	7440-32-6	M1
Zinc	831	mg/kg	3.4	1	04/23/18 07:48	04/26/18 13:42	7440-66-6	P6
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	54.7	mg/kg	0.63	1	04/25/18 09:25	04/26/18 04:15	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	3.7	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7440-36-0	
Arsenic	11.9	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7440-38-2	
Beryllium	ND	mg/kg	0.69	20	04/23/18 08:19	04/25/18 15:59	7440-41-7	
Cadmium	38.6	mg/kg	0.28	20	04/23/18 08:19	04/25/18 15:59	7440-43-9	
Cobalt	8.4	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7440-48-4	
Lead	691	mg/kg	0.34	20	04/23/18 08:19	04/25/18 15:59	7439-92-1	M6,R1
Lithium	2.4	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7439-93-2	
Selenium	1.8	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7782-49-2	
Strontium	31.2	mg/kg	1.7	20	04/23/18 08:19	04/25/18 15:59	7440-24-6	
Vanadium	40.2	mg/kg	3.4	20	04/23/18 08:19	04/25/18 15:59	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.72	mg/kg	0.065	1	04/23/18 07:02	04/24/18 16:27	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	71.2	%	0.10	1		04/24/18 15:34		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	83-32-9	
Acenaphthylene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM **Lab ID: 10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	120-12-7	
Benzo(a)anthracene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	56-55-3	
Benzo(a)pyrene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	101-55-3	
Butylbenzylphthalate	4230000	ug/kg	565000	250	04/20/18 16:47	04/27/18 17:40	85-68-7	
Carbazole	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	59-50-7	
4-Chloroaniline	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	108-60-1	
2-Chloronaphthalene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	91-58-7	
2-Chlorophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	7005-72-3	
Chrysene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	53-70-3	
Dibenzofuran	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	120-83-2	
Diethylphthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	105-67-9	
Dimethylphthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	131-11-3	
Di-n-butylphthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	582000	50	04/20/18 16:47	04/27/18 16:43	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	606-20-2	
Di-n-octylphthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	117-81-7	
Fluoranthene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	206-44-0	
Fluorene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	87-68-3	
Hexachlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	118-74-1	
Hexachloroethane	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	193-39-5	
Isophorone	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	78-59-1	
1-Methylnaphthalene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	90-12-0	
2-Methylnaphthalene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-03(2-10) WM** Lab ID: **10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	226000	50	04/20/18 16:47	04/27/18 16:43		
Naphthalene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	91-20-3	
2-Nitroaniline	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	88-74-4	
3-Nitroaniline	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	99-09-2	
4-Nitroaniline	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	100-01-6	
Nitrobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	98-95-3	
2-Nitrophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	88-75-5	
4-Nitrophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	86-30-6	
Pentachlorophenol	ND	ug/kg	229000	50	04/20/18 16:47	04/27/18 16:43	87-86-5	
Phenanthrene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	85-01-8	
Phenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	108-95-2	
Pyrene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	113000	50	04/20/18 16:47	04/27/18 16:43	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%.	43-125	50	04/20/18 16:47	04/27/18 16:43	4165-60-0	D4,S4
2-Fluorobiphenyl (S)	0	%.	30-132	50	04/20/18 16:47	04/27/18 16:43	321-60-8	S4
p-Terphenyl-d14 (S)	0	%.	62-125	50	04/20/18 16:47	04/27/18 16:43	1718-51-0	S4
Phenol-d6 (S)	0	%.	48-125	50	04/20/18 16:47	04/27/18 16:43	13127-88-3	S4
2-Fluorophenol (S)	0	%.	40-125	50	04/20/18 16:47	04/27/18 16:43	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%.	60-125	50	04/20/18 16:47	04/27/18 16:43	118-79-6	S4
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	83-32-9	
Acenaphthylene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	208-96-8	
Anthracene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	120-12-7	
Benzo(a)anthracene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	56-55-3	
Benzo(a)pyrene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	207-08-9	
Chrysene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	53-70-3	
Fluoranthene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	206-44-0	
Fluorene	206	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	193-39-5	
Naphthalene	199	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	91-20-3	
Phenanthrene	249	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	85-01-8	
Pyrene	ND	ug/kg	173	5	04/23/18 18:32	04/24/18 19:28	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	64	%.	42-125	5	04/23/18 18:32	04/24/18 19:28	321-60-8	D3
p-Terphenyl-d14 (S)	61	%.	57-125	5	04/23/18 18:32	04/24/18 19:28	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM **Lab ID: 10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	3470	1	05/01/18 16:53	05/02/18 20:15	67-64-1	
Allyl chloride	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	107-05-1	
Benzene	ND	ug/kg	69.3	1	05/01/18 16:53	05/02/18 20:15	71-43-2	
Bromobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	108-86-1	
Bromochloromethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	74-97-5	
Bromodichloromethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	75-27-4	
Bromoform	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	75-25-2	
Bromomethane	ND	ug/kg	1730	1	05/01/18 16:53	05/02/18 20:15	74-83-9	
2-Butanone (MEK)	ND	ug/kg	866	1	05/01/18 16:53	05/02/18 20:15	78-93-3	
n-Butylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	104-51-8	
sec-Butylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	135-98-8	
tert-Butylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	98-06-6	
Carbon tetrachloride	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	56-23-5	
Chlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	108-90-7	
Chloroethane	ND	ug/kg	1730	1	05/01/18 16:53	05/02/18 20:15	75-00-3	
Chloroform	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	67-66-3	
Chloromethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	74-87-3	
2-Chlorotoluene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	95-49-8	
4-Chlorotoluene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1730	1	05/01/18 16:53	05/02/18 20:15	96-12-8	
Dibromochloromethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	106-93-4	
Dibromomethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	541-73-1	
1,4-Dichlorobenzene	175	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	75-71-8	
1,1-Dichloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	75-34-3	
1,2-Dichloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	107-06-2	
1,1-Dichloroethene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1730	1	05/01/18 16:53	05/02/18 20:15	75-43-4	
1,2-Dichloropropane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	78-87-5	
1,3-Dichloropropane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	142-28-9	
2,2-Dichloropropane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	594-20-7	
1,1-Dichloropropene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	60-29-7	
Ethylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	866	1	05/01/18 16:53	05/02/18 20:15	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	98-82-8	
p-Isopropyltoluene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	99-87-6	
Methylene Chloride	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	866	1	05/01/18 16:53	05/02/18 20:15	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-03(2-10) WM **Lab ID: 10428096001** Collected: 04/19/18 09:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	1634-04-4	
Naphthalene	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	91-20-3	
n-Propylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	103-65-1	
Styrene	219	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	79-34-5	
Tetrachloroethene	178	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	127-18-4	D6
Tetrahydrofuran	ND	ug/kg	6930	1	05/01/18 16:53	05/02/18 20:15	109-99-9	
Toluene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	79-00-5	
Trichloroethene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	79-01-6	
Trichlorofluoromethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	693	1	05/01/18 16:53	05/02/18 20:15	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	173	1	05/01/18 16:53	05/02/18 20:15	108-67-8	
Vinyl chloride	ND	ug/kg	69.3	1	05/01/18 16:53	05/02/18 20:15	75-01-4	
Xylene (Total)	ND	ug/kg	520	1	05/01/18 16:53	05/02/18 20:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	05/01/18 16:53	05/02/18 20:15	17060-07-0	C0
Toluene-d8 (S)	96	%.	75-125	1	05/01/18 16:53	05/02/18 20:15	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125	1	05/01/18 16:53	05/02/18 20:15	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	34.1	5	04/28/18 10:35	05/01/18 11:00	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	54.7	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	4.0	mg/kg	2.3	1	04/25/18 11:00	04/25/18 13:44	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.9	2	04/27/18 12:45	04/30/18 19:36	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)

Methyl Mercury	ND	ng/g	7.33	1	05/04/18 10:07	05/07/18 14:10	7439-97-6	N3
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8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550

Aldrin	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	309-00-2	
alpha-BHC	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	319-84-6	
beta-BHC	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	319-85-7	
delta-BHC	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	58-89-9	
Chlordane (Technical)	ND	ug/kg	22.3	1	04/20/18 16:36	05/01/18 21:27	57-74-9	
alpha-Chlordane	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	5103-71-9	
gamma-Chlordane	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	5103-74-2	
4,4'-DDD	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	72-54-8	
4,4'-DDE	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	72-55-9	
4,4'-DDT	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	50-29-3	
Dieldrin	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	60-57-1	
Endosulfan I	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	959-98-8	
Endosulfan II	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	33213-65-9	
Endosulfan sulfate	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	1031-07-8	
Endrin	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	72-20-8	
Endrin aldehyde	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	7421-93-4	
Endrin ketone	ND	ug/kg	4.5	1	04/20/18 16:36	05/01/18 21:27	53494-70-5	
Heptachlor	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	76-44-8	
Heptachlor epoxide	ND	ug/kg	2.2	1	04/20/18 16:36	05/01/18 21:27	1024-57-3	
Methoxychlor	ND	ug/kg	22.3	1	04/20/18 16:36	05/01/18 21:27	72-43-5	
Toxaphene	ND	ug/kg	66.9	1	04/20/18 16:36	05/01/18 21:27	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	88	%	30-150	1	04/20/18 16:36	05/01/18 21:27	877-09-8	
Decachlorobiphenyl (S)	77	%	30-150	1	04/20/18 16:36	05/01/18 21:27	2051-24-3	

8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550

PCB-1016 (Aroclor 1016)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	11100-14-4	
PCB, Total	ND	ug/kg	44.1	1	04/20/18 16:33	04/24/18 16:29	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	72	%	48-125	1	04/20/18 16:33	04/24/18 16:29	877-09-8	
Decachlorobiphenyl (S)	104	%	30-134	1	04/20/18 16:33	04/24/18 16:29	2051-24-3	CH

WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO

WIDRO C10-C28	ND	mg/kg	8.3	1	04/20/18 17:57	04/22/18 13:50		
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	100	%	50-150	1	04/20/18 17:57	04/22/18 13:50	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	13.4	1	05/02/18 10:19	05/02/18 20:00		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	05/02/18 10:19	05/02/18 20:00	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	5520	mg/kg	12.4	1	04/23/18 07:48	04/26/18 14:02	7429-90-5	
Barium	78.6	mg/kg	0.62	1	04/23/18 07:48	04/26/18 14:02	7440-39-3	
Boron	9.3	mg/kg	9.3	1	04/23/18 07:48	04/26/18 14:02	7440-42-8	
Copper	8.9	mg/kg	0.62	1	04/23/18 07:48	04/26/18 14:02	7440-50-8	
Iron	10000	mg/kg	3.1	1	04/23/18 07:48	04/26/18 14:02	7439-89-6	
Manganese	498	mg/kg	0.31	1	04/23/18 07:48	04/26/18 14:02	7439-96-5	
Nickel	11.7	mg/kg	1.2	1	04/23/18 07:48	04/26/18 14:02	7440-02-0	
Silver	ND	mg/kg	0.62	1	04/23/18 07:48	04/26/18 14:02	7440-22-4	
Tin	ND	mg/kg	4.6	1	04/23/18 07:48	04/26/18 14:02	7440-31-5	
Titanium	155	mg/kg	1.5	1	04/23/18 07:48	04/26/18 14:02	7440-32-6	
Zinc	31.2	mg/kg	1.2	1	04/23/18 07:48	04/26/18 14:02	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	3.3	mg/kg	0.24	1	04/25/18 09:25	04/26/18 04:19	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7440-36-0	
Arsenic	3.4	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7440-38-2	
Beryllium	0.61	mg/kg	0.27	20	04/23/18 08:19	04/25/18 16:07	7440-41-7	
Cadmium	0.34	mg/kg	0.11	20	04/23/18 08:19	04/25/18 16:07	7440-43-9	
Cobalt	7.1	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7440-48-4	
Lead	8.9	mg/kg	0.13	20	04/23/18 08:19	04/25/18 16:07	7439-92-1	
Lithium	10.2	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7439-93-2	
Selenium	0.69	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7782-49-2	
Strontium	52.8	mg/kg	0.66	20	04/23/18 08:19	04/25/18 16:07	7440-24-6	
Vanadium	30.3	mg/kg	1.3	20	04/23/18 08:19	04/25/18 16:07	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.026	mg/kg	0.026	1	04/23/18 07:02	04/24/18 16:29	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	25.3	%	0.10	1		04/24/18 15:35		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	83-32-9	
Acenaphthylene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	120-12-7	
Benzo(a)anthracene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	56-55-3	
Benzo(a)pyrene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	101-55-3	
Butylbenzylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	85-68-7	
Carbazole	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	59-50-7	
4-Chloroaniline	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	108-60-1	
2-Chloronaphthalene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	91-58-7	
2-Chlorophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	7005-72-3	
Chrysene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	53-70-3	
Dibenzofuran	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	120-83-2	
Diethylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	105-67-9	
Dimethylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	131-11-3	
Di-n-butylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2270	1	04/20/18 16:47	04/27/18 15:16	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	606-20-2	
Di-n-octylphthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	117-81-7	
Fluoranthene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	206-44-0	
Fluorene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	87-68-3	
Hexachlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	118-74-1	
Hexachloroethane	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	193-39-5	
Isophorone	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	78-59-1	
1-Methylnaphthalene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	90-12-0	
2-Methylnaphthalene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	881	1	04/20/18 16:47	04/27/18 15:16		
Naphthalene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	91-20-3	
2-Nitroaniline	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	88-74-4	
3-Nitroaniline	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	99-09-2	
4-Nitroaniline	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	100-01-6	
Nitrobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	98-95-3	
2-Nitrophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	88-75-5	
4-Nitrophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	86-30-6	
Pentachlorophenol	ND	ug/kg	895	1	04/20/18 16:47	04/27/18 15:16	87-86-5	
Phenanthrene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	85-01-8	
Phenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	108-95-2	
Pyrene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	441	1	04/20/18 16:47	04/27/18 15:16	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	68	%.	43-125	1	04/20/18 16:47	04/27/18 15:16	4165-60-0	
2-Fluorobiphenyl (S)	71	%.	30-132	1	04/20/18 16:47	04/27/18 15:16	321-60-8	
p-Terphenyl-d14 (S)	85	%.	62-125	1	04/20/18 16:47	04/27/18 15:16	1718-51-0	
Phenol-d6 (S)	70	%.	48-125	1	04/20/18 16:47	04/27/18 15:16	13127-88-3	
2-Fluorophenol (S)	66	%.	40-125	1	04/20/18 16:47	04/27/18 15:16	367-12-4	
2,4,6-Tribromophenol (S)	58	%.	60-125	1	04/20/18 16:47	04/27/18 15:16	118-79-6	SO

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	83-32-9	
Acenaphthylene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	208-96-8	
Anthracene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	120-12-7	
Benzo(a)anthracene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	56-55-3	
Benzo(a)pyrene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	207-08-9	
Chrysene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	53-70-3	
Fluoranthene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	206-44-0	
Fluorene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	193-39-5	
Naphthalene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	91-20-3	
Phenanthrene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	85-01-8	
Pyrene	ND	ug/kg	13.4	1	04/23/18 18:32	04/24/18 14:59	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	89	%.	42-125	1	04/23/18 18:32	04/24/18 14:59	321-60-8	
p-Terphenyl-d14 (S)	96	%.	57-125	1	04/23/18 18:32	04/24/18 14:59	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1350	1	05/01/18 16:53	05/03/18 03:51	67-64-1	
Allyl chloride	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	107-05-1	
Benzene	ND	ug/kg	27.1	1	05/01/18 16:53	05/03/18 03:51	71-43-2	
Bromobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	108-86-1	
Bromochloromethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	74-97-5	
Bromodichloromethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	75-27-4	
Bromoform	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	75-25-2	
Bromomethane	ND	ug/kg	677	1	05/01/18 16:53	05/03/18 03:51	74-83-9	
2-Butanone (MEK)	ND	ug/kg	338	1	05/01/18 16:53	05/03/18 03:51	78-93-3	
n-Butylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	104-51-8	
sec-Butylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	135-98-8	
tert-Butylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	98-06-6	
Carbon tetrachloride	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	56-23-5	
Chlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	108-90-7	
Chloroethane	ND	ug/kg	677	1	05/01/18 16:53	05/03/18 03:51	75-00-3	
Chloroform	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	67-66-3	
Chloromethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	74-87-3	
2-Chlorotoluene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	95-49-8	
4-Chlorotoluene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	677	1	05/01/18 16:53	05/03/18 03:51	96-12-8	
Dibromochloromethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	106-93-4	
Dibromomethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	75-71-8	
1,1-Dichloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	75-34-3	
1,2-Dichloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	107-06-2	
1,1-Dichloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	156-60-5	
Dichlorofluoromethane	ND	ug/kg	677	1	05/01/18 16:53	05/03/18 03:51	75-43-4	
1,2-Dichloropropane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	78-87-5	
1,3-Dichloropropane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	142-28-9	
2,2-Dichloropropane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	594-20-7	
1,1-Dichloropropene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	60-29-7	
Ethylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	338	1	05/01/18 16:53	05/03/18 03:51	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	98-82-8	
p-Isopropyltoluene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	99-87-6	
Methylene Chloride	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	338	1	05/01/18 16:53	05/03/18 03:51	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-06 (0-10) S **Lab ID: 10428096002** Collected: 04/19/18 11:45 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	1634-04-4	
Naphthalene	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	91-20-3	
n-Propylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	103-65-1	
Styrene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	79-34-5	
Tetrachloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	127-18-4	
Tetrahydrofuran	ND	ug/kg	2710	1	05/01/18 16:53	05/03/18 03:51	109-99-9	
Toluene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	79-00-5	
Trichloroethene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	79-01-6	
Trichlorofluoromethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	271	1	05/01/18 16:53	05/03/18 03:51	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	67.7	1	05/01/18 16:53	05/03/18 03:51	108-67-8	
Vinyl chloride	ND	ug/kg	27.1	1	05/01/18 16:53	05/03/18 03:51	75-01-4	
Xylene (Total)	ND	ug/kg	203	1	05/01/18 16:53	05/03/18 03:51	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	75-125	1	05/01/18 16:53	05/03/18 03:51	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	05/01/18 16:53	05/03/18 03:51	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125	1	05/01/18 16:53	05/03/18 03:51	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	13.4	5	04/28/18 10:35	05/01/18 13:40	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	3.3	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.51	1	04/25/18 11:00	04/25/18 13:45	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	3.0	mg/kg	1.0	1	04/27/18 12:45	04/30/18 18:57	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-04 (2-14) WM** Lab ID: **10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	9.16	1	05/04/18 10:07	05/07/18 14:17	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	309-00-2	
alpha-BHC	4.7	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	319-84-6	
beta-BHC	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	319-85-7	
delta-BHC	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	58-89-9	
Chlordane (Technical)	ND	ug/kg	45.1	2	04/20/18 16:36	05/01/18 22:03	57-74-9	
alpha-Chlordane	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	5103-71-9	
gamma-Chlordane	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	5103-74-2	
4,4'-DDD	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	72-54-8	
4,4'-DDE	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	72-55-9	
4,4'-DDT	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	50-29-3	
Dieldrin	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	60-57-1	
Endosulfan I	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	959-98-8	
Endosulfan II	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	33213-65-9	
Endosulfan sulfate	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	1031-07-8	
Endrin	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	72-20-8	
Endrin aldehyde	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	7421-93-4	
Endrin ketone	ND	ug/kg	9.0	2	04/20/18 16:36	05/01/18 22:03	53494-70-5	
Heptachlor	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	76-44-8	
Heptachlor epoxide	ND	ug/kg	4.5	2	04/20/18 16:36	05/01/18 22:03	1024-57-3	
Methoxychlor	ND	ug/kg	45.1	2	04/20/18 16:36	05/01/18 22:03	72-43-5	
Toxaphene	ND	ug/kg	135	2	04/20/18 16:36	05/01/18 22:03	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	84	%	30-150	2	04/20/18 16:36	05/01/18 22:03	877-09-8	3M, D4
Decachlorobiphenyl (S)	74	%	30-150	2	04/20/18 16:36	05/01/18 22:03	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11141-16-5	
PCB-1242 (Aroclor 1242)	475	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	12672-29-6	
PCB-1254 (Aroclor 1254)	158	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	11100-14-4	
PCB, Total	633	ug/kg	44.7	1	04/20/18 16:33	04/24/18 15:42	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	86	%	48-125	1	04/20/18 16:33	04/24/18 15:42	877-09-8	
Decachlorobiphenyl (S)	113	%	30-134	1	04/20/18 16:33	04/24/18 15:42	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WIDRO C10-C28	171	mg/kg	101	10	04/20/18 17:57	04/22/18 13:00		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-04 (2-14) WM **Lab ID: 10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/20/18 17:57	04/22/18 13:00	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	14.2	1	05/02/18 10:19	05/02/18 13:42		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	05/02/18 10:19	05/02/18 13:42	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9530	mg/kg	12.9	1	04/23/18 07:48	04/26/18 14:05	7429-90-5	
Barium	177	mg/kg	0.64	1	04/23/18 07:48	04/26/18 14:05	7440-39-3	
Boron	12.2	mg/kg	9.7	1	04/23/18 07:48	04/26/18 14:05	7440-42-8	
Copper	102	mg/kg	0.64	1	04/23/18 07:48	04/26/18 14:05	7440-50-8	
Iron	26700	mg/kg	16.1	5	04/23/18 07:48	04/26/18 14:53	7439-89-6	
Manganese	531	mg/kg	0.32	1	04/23/18 07:48	04/26/18 14:05	7439-96-5	
Nickel	27.5	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:05	7440-02-0	
Silver	ND	mg/kg	0.64	1	04/23/18 07:48	04/26/18 14:05	7440-22-4	
Tin	16.6	mg/kg	4.8	1	04/23/18 07:48	04/26/18 14:05	7440-31-5	
Titanium	181	mg/kg	1.6	1	04/23/18 07:48	04/26/18 14:05	7440-32-6	
Zinc	364	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:05	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	5.0	mg/kg	0.25	1	04/25/18 09:25	04/26/18 04:24	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.3	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7440-36-0	
Arsenic	8.9	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7440-38-2	
Beryllium	0.89	mg/kg	0.25	20	04/23/18 08:19	04/25/18 16:10	7440-41-7	
Cadmium	1.0	mg/kg	0.10	20	04/23/18 08:19	04/25/18 16:10	7440-43-9	
Cobalt	10.6	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7440-48-4	
Lead	273	mg/kg	0.13	20	04/23/18 08:19	04/25/18 16:10	7439-92-1	
Lithium	8.6	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7439-93-2	
Selenium	0.84	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7782-49-2	
Strontium	54.8	mg/kg	0.63	20	04/23/18 08:19	04/25/18 16:10	7440-24-6	
Vanadium	38.0	mg/kg	1.3	20	04/23/18 08:19	04/25/18 16:10	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.20	mg/kg	0.026	1	04/23/18 07:02	04/24/18 16:35	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	26.1	%	0.10	1		04/30/18 11:27		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	83-32-9	
Acenaphthylene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-04 (2-14) WM** Lab ID: **10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	120-12-7	
Benzo(a)anthracene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	56-55-3	
Benzo(a)pyrene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	101-55-3	
Butylbenzylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	85-68-7	
Carbazole	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	59-50-7	
4-Chloroaniline	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	108-60-1	
2-Chloronaphthalene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	91-58-7	
2-Chlorophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	7005-72-3	
Chrysene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	53-70-3	
Dibenzofuran	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	120-83-2	
Diethylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	105-67-9	
Dimethylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	131-11-3	
Di-n-butylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2300	1	04/20/18 16:47	04/26/18 19:05	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	606-20-2	
Di-n-octylphthalate	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	122-66-7	
bis(2-Ethylhexyl)phthalate	488	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	117-81-7	
Fluoranthene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	206-44-0	
Fluorene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	87-68-3	
Hexachlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	118-74-1	
Hexachloroethane	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	193-39-5	
Isophorone	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	78-59-1	
1-Methylnaphthalene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	90-12-0	
2-Methylnaphthalene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-04 (2-14) WM **Lab ID: 10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	893	1	04/20/18 16:47	04/26/18 19:05		
Naphthalene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	91-20-3	
2-Nitroaniline	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	88-74-4	
3-Nitroaniline	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	99-09-2	
4-Nitroaniline	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	100-01-6	
Nitrobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	98-95-3	
2-Nitrophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	88-75-5	
4-Nitrophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	86-30-6	
Pentachlorophenol	ND	ug/kg	906	1	04/20/18 16:47	04/26/18 19:05	87-86-5	
Phenanthrene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	85-01-8	
Phenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	108-95-2	
Pyrene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	446	1	04/20/18 16:47	04/26/18 19:05	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	58	%.	43-125	1	04/20/18 16:47	04/26/18 19:05	4165-60-0	
2-Fluorobiphenyl (S)	71	%.	30-132	1	04/20/18 16:47	04/26/18 19:05	321-60-8	
p-Terphenyl-d14 (S)	89	%.	62-125	1	04/20/18 16:47	04/26/18 19:05	1718-51-0	
Phenol-d6 (S)	63	%.	48-125	1	04/20/18 16:47	04/26/18 19:05	13127-88-3	
2-Fluorophenol (S)	60	%.	40-125	1	04/20/18 16:47	04/26/18 19:05	367-12-4	
2,4,6-Tribromophenol (S)	65	%.	60-125	1	04/20/18 16:47	04/26/18 19:05	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	83-32-9	
Acenaphthylene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	208-96-8	
Anthracene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	120-12-7	
Benzo(a)anthracene	98.8	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	56-55-3	
Benzo(a)pyrene	124	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	50-32-8	
Benzo(b)fluoranthene	135	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	205-99-2	
Benzo(g,h,i)perylene	121	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	191-24-2	
Benzo(k)fluoranthene	45.7	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	207-08-9	
Chrysene	96.3	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	218-01-9	
Dibenz(a,h)anthracene	27.8	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	53-70-3	
Fluoranthene	146	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	206-44-0	
Fluorene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	86-73-7	
Indeno(1,2,3-cd)pyrene	66.3	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	193-39-5	
Naphthalene	ND	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	91-20-3	
Phenanthrene	78.7	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	85-01-8	
Pyrene	124	ug/kg	27.0	2	04/23/18 18:32	04/25/18 18:02	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	101	%.	42-125	2	04/23/18 18:32	04/25/18 18:02	321-60-8	D3
p-Terphenyl-d14 (S)	115	%.	57-125	2	04/23/18 18:32	04/25/18 18:02	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-04 (2-14) WM **Lab ID: 10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1440	1	05/01/18 16:53	05/03/18 04:08	67-64-1	
Allyl chloride	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	107-05-1	
Benzene	ND	ug/kg	28.8	1	05/01/18 16:53	05/03/18 04:08	71-43-2	
Bromobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	108-86-1	
Bromochloromethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	74-97-5	
Bromodichloromethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	75-27-4	
Bromoform	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	75-25-2	
Bromomethane	ND	ug/kg	720	1	05/01/18 16:53	05/03/18 04:08	74-83-9	
2-Butanone (MEK)	ND	ug/kg	360	1	05/01/18 16:53	05/03/18 04:08	78-93-3	
n-Butylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	104-51-8	
sec-Butylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	135-98-8	
tert-Butylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	98-06-6	
Carbon tetrachloride	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	56-23-5	
Chlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	108-90-7	
Chloroethane	ND	ug/kg	720	1	05/01/18 16:53	05/03/18 04:08	75-00-3	
Chloroform	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	67-66-3	
Chloromethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	74-87-3	
2-Chlorotoluene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	95-49-8	
4-Chlorotoluene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	720	1	05/01/18 16:53	05/03/18 04:08	96-12-8	
Dibromochloromethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	106-93-4	
Dibromomethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	75-71-8	
1,1-Dichloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	75-34-3	
1,2-Dichloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	107-06-2	
1,1-Dichloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	156-60-5	
Dichlorofluoromethane	ND	ug/kg	720	1	05/01/18 16:53	05/03/18 04:08	75-43-4	
1,2-Dichloropropane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	78-87-5	
1,3-Dichloropropane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	142-28-9	
2,2-Dichloropropane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	594-20-7	
1,1-Dichloropropene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	60-29-7	
Ethylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	360	1	05/01/18 16:53	05/03/18 04:08	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	98-82-8	
p-Isopropyltoluene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	99-87-6	
Methylene Chloride	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	360	1	05/01/18 16:53	05/03/18 04:08	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-04 (2-14) WM **Lab ID: 10428096003** Collected: 04/19/18 12:30 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	1634-04-4	
Naphthalene	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	91-20-3	
n-Propylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	103-65-1	
Styrene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	79-34-5	
Tetrachloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	127-18-4	
Tetrahydrofuran	ND	ug/kg	2880	1	05/01/18 16:53	05/03/18 04:08	109-99-9	
Toluene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	79-00-5	
Trichloroethene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	79-01-6	
Trichlorofluoromethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	288	1	05/01/18 16:53	05/03/18 04:08	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	72.0	1	05/01/18 16:53	05/03/18 04:08	108-67-8	
Vinyl chloride	ND	ug/kg	28.8	1	05/01/18 16:53	05/03/18 04:08	75-01-4	
Xylene (Total)	ND	ug/kg	216	1	05/01/18 16:53	05/03/18 04:08	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	75-125	1	05/01/18 16:53	05/03/18 04:08	17060-07-0	
Toluene-d8 (S)	98	%	75-125	1	05/01/18 16:53	05/03/18 04:08	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125	1	05/01/18 16:53	05/03/18 04:08	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	13.2	5	04/28/18 10:35	05/01/18 13:41	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	5.0	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.61	mg/kg	0.45	1	04/25/18 11:00	04/25/18 13:46	57-12-5	M0,R1
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/27/18 12:45	04/30/18 17:59	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-05 (5-15) WM** Lab ID: **10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	11.5	1	05/04/18 10:07	05/07/18 14:23	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	309-00-2	
alpha-BHC	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	319-84-6	
beta-BHC	18.5	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	319-85-7	
delta-BHC	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	58-89-9	M1
Chlordane (Technical)	ND	ug/kg	130	5	04/20/18 16:36	05/01/18 19:55	57-74-9	
alpha-Chlordane	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	5103-71-9	
gamma-Chlordane	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	5103-74-2	
4,4'-DDD	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	72-54-8	M1
4,4'-DDE	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	72-55-9	
4,4'-DDT	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	50-29-3	
Dieldrin	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	60-57-1	
Endosulfan I	22.0	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	959-98-8	M1
Endosulfan II	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	33213-65-9	
Endosulfan sulfate	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	1031-07-8	
Endrin	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	72-20-8	
Endrin aldehyde	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	7421-93-4	
Endrin ketone	ND	ug/kg	25.8	5	04/20/18 16:36	05/01/18 19:55	53494-70-5	
Heptachlor	ND	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	76-44-8	
Heptachlor epoxide	19.9	ug/kg	13.0	5	04/20/18 16:36	05/01/18 19:55	1024-57-3	M1
Methoxychlor	ND	ug/kg	130	5	04/20/18 16:36	05/01/18 19:55	72-43-5	
Toxaphene	ND	ug/kg	388	5	04/20/18 16:36	05/01/18 19:55	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	108	%	30-150	5	04/20/18 16:36	05/01/18 19:55	877-09-8	2M,D4
Decachlorobiphenyl (S)	105	%	30-150	5	04/20/18 16:36	05/01/18 19:55	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11141-16-5	
PCB-1242 (Aroclor 1242)	1000	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	12672-29-6	
PCB-1254 (Aroclor 1254)	224	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	11100-14-4	
PCB, Total	1230	ug/kg	51.1	1	04/20/18 16:33	04/24/18 15:26	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	78	%	48-125	1	04/20/18 16:33	04/24/18 15:26	877-09-8	
Decachlorobiphenyl (S)	98	%	30-134	1	04/20/18 16:33	04/24/18 15:26	2051-24-3	CH
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	395	mg/kg	236	20	04/20/18 17:57	04/22/18 14:11		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-05 (5-15) WM **Lab ID: 10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	20	04/20/18 17:57	04/22/18 14:11	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	74.1	mg/kg	15.9	1	05/02/18 10:19	05/02/18 20:24		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	05/02/18 10:19	05/02/18 20:24	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	23100	mg/kg	14.5	1	04/23/18 07:48	04/26/18 14:07	7429-90-5	
Barium	246	mg/kg	0.73	1	04/23/18 07:48	04/26/18 14:07	7440-39-3	
Boron	73.4	mg/kg	10.9	1	04/23/18 07:48	04/26/18 14:07	7440-42-8	
Copper	175	mg/kg	0.73	1	04/23/18 07:48	04/26/18 14:07	7440-50-8	
Iron	22000	mg/kg	18.1	5	04/23/18 07:48	04/26/18 14:55	7439-89-6	
Manganese	522	mg/kg	0.36	1	04/23/18 07:48	04/26/18 14:07	7439-96-5	
Nickel	16.3	mg/kg	1.5	1	04/23/18 07:48	04/26/18 14:07	7440-02-0	
Silver	ND	mg/kg	0.73	1	04/23/18 07:48	04/26/18 14:07	7440-22-4	
Tin	25.8	mg/kg	5.4	1	04/23/18 07:48	04/26/18 14:07	7440-31-5	
Titanium	277	mg/kg	1.8	1	04/23/18 07:48	04/26/18 14:07	7440-32-6	
Zinc	463	mg/kg	1.5	1	04/23/18 07:48	04/26/18 14:07	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	3.6	mg/kg	0.29	1	04/25/18 09:25	04/26/18 04:28	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	1.3	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7440-36-0	
Arsenic	8.1	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7440-38-2	
Beryllium	0.68	mg/kg	0.29	20	04/23/18 08:19	04/24/18 18:59	7440-41-7	
Cadmium	2.5	mg/kg	0.12	20	04/23/18 08:19	04/24/18 18:59	7440-43-9	
Cobalt	7.0	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7440-48-4	
Lead	284	mg/kg	0.15	20	04/23/18 08:19	04/24/18 18:59	7439-92-1	
Lithium	7.4	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7439-93-2	
Selenium	0.90	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7782-49-2	
Strontium	32.0	mg/kg	0.73	20	04/23/18 08:19	04/24/18 18:59	7440-24-6	
Vanadium	30.7	mg/kg	1.5	20	04/23/18 08:19	04/24/18 18:59	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.55	mg/kg	0.027	1	04/23/18 07:02	04/24/18 16:37	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	35.6	%	0.10	1		04/30/18 11:27		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	83-32-9	
Acenaphthylene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: **FL-TT-05 (5-15) WM** Lab ID: **10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	120-12-7	
Benzo(a)anthracene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	56-55-3	
Benzo(a)pyrene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	101-55-3	
Butylbenzylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	85-68-7	
Carbazole	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	59-50-7	
4-Chloroaniline	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	108-60-1	
2-Chloronaphthalene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	91-58-7	
2-Chlorophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	7005-72-3	
Chrysene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	53-70-3	
Dibenzofuran	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	120-83-2	
Diethylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	105-67-9	
Dimethylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	131-11-3	
Di-n-butylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	2630	1	04/20/18 16:47	04/26/18 19:34	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	606-20-2	
Di-n-octylphthalate	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	122-66-7	
bis(2-Ethylhexyl)phthalate	2200	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	117-81-7	
Fluoranthene	874	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	206-44-0	
Fluorene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	87-68-3	
Hexachlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	118-74-1	
Hexachloroethane	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	193-39-5	
Isophorone	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	78-59-1	
1-Methylnaphthalene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	90-12-0	
2-Methylnaphthalene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-05 (5-15) WM **Lab ID: 10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1020	1	04/20/18 16:47	04/26/18 19:34		
Naphthalene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	91-20-3	
2-Nitroaniline	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	88-74-4	
3-Nitroaniline	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	99-09-2	
4-Nitroaniline	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	100-01-6	
Nitrobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	98-95-3	
2-Nitrophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	88-75-5	
4-Nitrophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	86-30-6	
Pentachlorophenol	ND	ug/kg	1040	1	04/20/18 16:47	04/26/18 19:34	87-86-5	
Phenanthrene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	85-01-8	
Phenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	108-95-2	
Pyrene	790	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	511	1	04/20/18 16:47	04/26/18 19:34	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	62	%.	43-125	1	04/20/18 16:47	04/26/18 19:34	4165-60-0	
2-Fluorobiphenyl (S)	76	%.	30-132	1	04/20/18 16:47	04/26/18 19:34	321-60-8	
p-Terphenyl-d14 (S)	90	%.	62-125	1	04/20/18 16:47	04/26/18 19:34	1718-51-0	
Phenol-d6 (S)	71	%.	48-125	1	04/20/18 16:47	04/26/18 19:34	13127-88-3	
2-Fluorophenol (S)	70	%.	40-125	1	04/20/18 16:47	04/26/18 19:34	367-12-4	
2,4,6-Tribromophenol (S)	78	%.	60-125	1	04/20/18 16:47	04/26/18 19:34	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	83-32-9	
Acenaphthylene	154	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	208-96-8	
Anthracene	169	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	120-12-7	
Benzo(a)anthracene	748	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	56-55-3	
Benzo(a)pyrene	788	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	50-32-8	
Benzo(b)fluoranthene	997	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	205-99-2	
Benzo(g,h,i)perylene	503	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	191-24-2	
Benzo(k)fluoranthene	391	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	207-08-9	
Chrysene	764	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	218-01-9	
Dibenz(a,h)anthracene	123	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	53-70-3	
Fluoranthene	1340	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	206-44-0	
Fluorene	ND	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	86-73-7	
Indeno(1,2,3-cd)pyrene	453	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	193-39-5	
Naphthalene	ND	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	91-20-3	
Phenanthrene	437	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	85-01-8	
Pyrene	1100	ug/kg	77.6	5	04/23/18 18:32	04/24/18 20:10	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%.	42-125	5	04/23/18 18:32	04/24/18 20:10	321-60-8	D3
p-Terphenyl-d14 (S)	96	%.	57-125	5	04/23/18 18:32	04/24/18 20:10	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-05 (5-15) WM **Lab ID: 10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1520	1	05/01/18 16:53	05/03/18 04:25	67-64-1	
Allyl chloride	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	107-05-1	
Benzene	ND	ug/kg	30.3	1	05/01/18 16:53	05/03/18 04:25	71-43-2	
Bromobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	108-86-1	
Bromochloromethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	74-97-5	
Bromodichloromethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	75-27-4	
Bromoform	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	75-25-2	
Bromomethane	ND	ug/kg	759	1	05/01/18 16:53	05/03/18 04:25	74-83-9	
2-Butanone (MEK)	ND	ug/kg	379	1	05/01/18 16:53	05/03/18 04:25	78-93-3	
n-Butylbenzene	234	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	104-51-8	
sec-Butylbenzene	269	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	135-98-8	
tert-Butylbenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	98-06-6	
Carbon tetrachloride	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	56-23-5	
Chlorobenzene	129	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	108-90-7	
Chloroethane	ND	ug/kg	759	1	05/01/18 16:53	05/03/18 04:25	75-00-3	
Chloroform	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	67-66-3	
Chloromethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	74-87-3	
2-Chlorotoluene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	95-49-8	
4-Chlorotoluene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	759	1	05/01/18 16:53	05/03/18 04:25	96-12-8	
Dibromochloromethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	106-93-4	
Dibromomethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	541-73-1	
1,4-Dichlorobenzene	443	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	75-71-8	
1,1-Dichloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	75-34-3	
1,2-Dichloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	107-06-2	
1,1-Dichloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	156-60-5	
Dichlorofluoromethane	ND	ug/kg	759	1	05/01/18 16:53	05/03/18 04:25	75-43-4	
1,2-Dichloropropane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	78-87-5	
1,3-Dichloropropane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	142-28-9	
2,2-Dichloropropane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	594-20-7	
1,1-Dichloropropene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	60-29-7	
Ethylbenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	379	1	05/01/18 16:53	05/03/18 04:25	87-68-3	
Isopropylbenzene (Cumene)	127	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	98-82-8	
p-Isopropyltoluene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	99-87-6	
Methylene Chloride	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	379	1	05/01/18 16:53	05/03/18 04:25	108-10-1	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-05 (5-15) WM **Lab ID: 10428096004** Collected: 04/19/18 15:00 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	1634-04-4	
Naphthalene	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	91-20-3	
n-Propylbenzene	121	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	103-65-1	
Styrene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	79-34-5	
Tetrachloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	127-18-4	
Tetrahydrofuran	ND	ug/kg	3030	1	05/01/18 16:53	05/03/18 04:25	109-99-9	
Toluene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	79-00-5	
Trichloroethene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	79-01-6	
Trichlorofluoromethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:25	76-13-1	
1,2,4-Trimethylbenzene	164	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	75.9	1	05/01/18 16:53	05/03/18 04:25	108-67-8	
Vinyl chloride	ND	ug/kg	30.3	1	05/01/18 16:53	05/03/18 04:25	75-01-4	
Xylene (Total)	ND	ug/kg	228	1	05/01/18 16:53	05/03/18 04:25	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:25	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	05/01/18 16:53	05/03/18 04:25	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:25	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	15.8	5	04/28/18 10:35	05/01/18 13:41	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	3.6	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	0.47	1	04/26/18 10:15	04/26/18 14:28	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/27/18 12:45	04/30/18 19:56	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury								
Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	12.3	1	05/04/18 10:07	05/07/18 14:57	7439-97-6	N3
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	309-00-2	
alpha-BHC	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	319-84-6	
beta-BHC	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	319-85-7	
delta-BHC	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	58-89-9	
Chlordane (Technical)	ND	ug/kg	64.4	2	04/20/18 16:36	05/01/18 22:22	57-74-9	
alpha-Chlordane	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	5103-71-9	
gamma-Chlordane	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	5103-74-2	
4,4'-DDD	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	72-54-8	
4,4'-DDE	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	72-55-9	
4,4'-DDT	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	50-29-3	
Dieldrin	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	60-57-1	
Endosulfan I	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	959-98-8	
Endosulfan II	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	33213-65-9	
Endosulfan sulfate	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	1031-07-8	
Endrin	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	72-20-8	
Endrin aldehyde	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	7421-93-4	
Endrin ketone	ND	ug/kg	12.8	2	04/20/18 16:36	05/01/18 22:22	53494-70-5	
Heptachlor	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	76-44-8	
Heptachlor epoxide	ND	ug/kg	6.4	2	04/20/18 16:36	05/01/18 22:22	1024-57-3	
Methoxychlor	ND	ug/kg	64.4	2	04/20/18 16:36	05/01/18 22:22	72-43-5	
Toxaphene	ND	ug/kg	193	2	04/20/18 16:36	05/01/18 22:22	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	78	%	30-150	2	04/20/18 16:36	05/01/18 22:22	877-09-8	3M, D3
Decachlorobiphenyl (S)	67	%	30-150	2	04/20/18 16:36	05/01/18 22:22	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	11100-14-4	
PCB, Total	ND	ug/kg	63.6	1	04/20/18 16:33	04/24/18 16:45	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	82	%	48-125	1	04/20/18 16:33	04/24/18 16:45	877-09-8	
Decachlorobiphenyl (S)	106	%	30-134	1	04/20/18 16:33	04/24/18 16:45	2051-24-3	
WIDRO GCS								
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/kg	14.7	1	04/20/18 17:57	04/22/18 13:43		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	101	%	50-150	1	04/20/18 17:57	04/22/18 13:43	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	18.5	1	05/02/18 10:19	05/02/18 20:49		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%	80-150	1	05/02/18 10:19	05/02/18 20:49	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	8590	mg/kg	19.1	1	04/23/18 07:48	04/26/18 14:10	7429-90-5	
Barium	240	mg/kg	0.96	1	04/23/18 07:48	04/26/18 14:10	7440-39-3	
Boron	27.0	mg/kg	14.3	1	04/23/18 07:48	04/26/18 14:10	7440-42-8	
Copper	17.5	mg/kg	0.96	1	04/23/18 07:48	04/26/18 14:10	7440-50-8	
Iron	23300	mg/kg	23.9	5	04/23/18 07:48	04/26/18 14:58	7439-89-6	
Manganese	999	mg/kg	2.4	5	04/23/18 07:48	04/26/18 14:58	7439-96-5	
Nickel	16.4	mg/kg	1.9	1	04/23/18 07:48	04/26/18 14:10	7440-02-0	
Silver	ND	mg/kg	0.96	1	04/23/18 07:48	04/26/18 14:10	7440-22-4	
Tin	ND	mg/kg	7.2	1	04/23/18 07:48	04/26/18 14:10	7440-31-5	
Titanium	170	mg/kg	2.4	1	04/23/18 07:48	04/26/18 14:10	7440-32-6	
Zinc	62.5	mg/kg	1.9	1	04/23/18 07:48	04/26/18 14:10	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	7.5	mg/kg	0.37	1	04/25/18 09:25	04/26/18 04:33	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7440-36-0	
Arsenic	6.3	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7440-38-2	
Beryllium	0.67	mg/kg	0.36	20	04/23/18 08:19	04/25/18 16:13	7440-41-7	
Cadmium	0.47	mg/kg	0.14	20	04/23/18 08:19	04/25/18 16:13	7440-43-9	
Cobalt	8.3	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7440-48-4	
Lead	16.2	mg/kg	0.18	20	04/23/18 08:19	04/25/18 16:13	7439-92-1	
Lithium	9.8	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7439-93-2	
Selenium	2.2	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7782-49-2	
Strontium	102	mg/kg	0.90	20	04/23/18 08:19	04/25/18 16:13	7440-24-6	
Vanadium	29.8	mg/kg	1.8	20	04/23/18 08:19	04/25/18 16:13	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.065	mg/kg	0.037	1	04/23/18 07:02	04/24/18 16:39	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	48.2	%	0.10	1		04/30/18 11:28		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	83-32-9	
Acenaphthylene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	120-12-7	
Benzo(a)anthracene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	56-55-3	
Benzo(a)pyrene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	101-55-3	
Butylbenzylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	85-68-7	
Carbazole	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	59-50-7	
4-Chloroaniline	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	108-60-1	
2-Chloronaphthalene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	91-58-7	
2-Chlorophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	7005-72-3	
Chrysene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	53-70-3	
Dibenzofuran	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	120-83-2	
Diethylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	105-67-9	
Dimethylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	131-11-3	
Di-n-butylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	3280	1	04/20/18 16:47	04/26/18 20:03	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	606-20-2	
Di-n-octylphthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	122-66-7	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	117-81-7	
Fluoranthene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	206-44-0	
Fluorene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	87-68-3	
Hexachlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	118-74-1	
Hexachloroethane	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	193-39-5	
Isophorone	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	78-59-1	
1-Methylnaphthalene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	90-12-0	
2-Methylnaphthalene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3550

3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1270	1	04/20/18 16:47	04/26/18 20:03		
Naphthalene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	91-20-3	
2-Nitroaniline	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	88-74-4	
3-Nitroaniline	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	99-09-2	
4-Nitroaniline	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	100-01-6	
Nitrobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	98-95-3	
2-Nitrophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	88-75-5	
4-Nitrophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	86-30-6	
Pentachlorophenol	ND	ug/kg	1290	1	04/20/18 16:47	04/26/18 20:03	87-86-5	
Phenanthrene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	85-01-8	
Phenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	108-95-2	
Pyrene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	636	1	04/20/18 16:47	04/26/18 20:03	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	57	%.	43-125	1	04/20/18 16:47	04/26/18 20:03	4165-60-0	
2-Fluorobiphenyl (S)	71	%.	30-132	1	04/20/18 16:47	04/26/18 20:03	321-60-8	
p-Terphenyl-d14 (S)	89	%.	62-125	1	04/20/18 16:47	04/26/18 20:03	1718-51-0	
Phenol-d6 (S)	65	%.	48-125	1	04/20/18 16:47	04/26/18 20:03	13127-88-3	
2-Fluorophenol (S)	62	%.	40-125	1	04/20/18 16:47	04/26/18 20:03	367-12-4	
2,4,6-Tribromophenol (S)	60	%.	60-125	1	04/20/18 16:47	04/26/18 20:03	118-79-6	

8270D MSSV PAH by SIM

Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550

Acenaphthene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	83-32-9	
Acenaphthylene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	208-96-8	
Anthracene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	120-12-7	
Benzo(a)anthracene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	56-55-3	
Benzo(a)pyrene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	207-08-9	
Chrysene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	53-70-3	
Fluoranthene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	206-44-0	
Fluorene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	193-39-5	
Naphthalene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	91-20-3	
Phenanthrene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	85-01-8	
Pyrene	ND	ug/kg	19.3	1	04/20/18 15:33	04/24/18 21:12	129-00-0	

Surrogates

2-Fluorobiphenyl (S)	56	%.	42-125	1	04/20/18 15:33	04/24/18 21:12	321-60-8	
p-Terphenyl-d14 (S)	68	%.	57-125	1	04/20/18 15:33	04/24/18 21:12	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2020	1	05/01/18 16:53	05/03/18 04:42	67-64-1	
Allyl chloride	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	107-05-1	
Benzene	ND	ug/kg	40.4	1	05/01/18 16:53	05/03/18 04:42	71-43-2	
Bromobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	108-86-1	
Bromochloromethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	74-97-5	
Bromodichloromethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	75-27-4	
Bromoform	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	75-25-2	
Bromomethane	ND	ug/kg	1010	1	05/01/18 16:53	05/03/18 04:42	74-83-9	
2-Butanone (MEK)	ND	ug/kg	505	1	05/01/18 16:53	05/03/18 04:42	78-93-3	
n-Butylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	104-51-8	
sec-Butylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	135-98-8	
tert-Butylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	98-06-6	
Carbon tetrachloride	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	56-23-5	
Chlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	108-90-7	
Chloroethane	ND	ug/kg	1010	1	05/01/18 16:53	05/03/18 04:42	75-00-3	
Chloroform	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	67-66-3	
Chloromethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	74-87-3	
2-Chlorotoluene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	95-49-8	
4-Chlorotoluene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1010	1	05/01/18 16:53	05/03/18 04:42	96-12-8	
Dibromochloromethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	106-93-4	
Dibromomethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	75-71-8	
1,1-Dichloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	75-34-3	
1,2-Dichloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	107-06-2	
1,1-Dichloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1010	1	05/01/18 16:53	05/03/18 04:42	75-43-4	
1,2-Dichloropropane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	78-87-5	
1,3-Dichloropropane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	142-28-9	
2,2-Dichloropropane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	594-20-7	
1,1-Dichloropropene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	60-29-7	
Ethylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	505	1	05/01/18 16:53	05/03/18 04:42	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	98-82-8	
p-Isopropyltoluene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	99-87-6	
Methylene Chloride	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	505	1	05/01/18 16:53	05/03/18 04:42	108-10-1	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Sample: FL-TT-07 (1-5) S **Lab ID: 10428096005** Collected: 04/19/18 17:15 Received: 04/20/18 08:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	1634-04-4	
Naphthalene	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	91-20-3	
n-Propylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	103-65-1	
Styrene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	79-34-5	
Tetrachloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	127-18-4	
Tetrahydrofuran	ND	ug/kg	4040	1	05/01/18 16:53	05/03/18 04:42	109-99-9	
Toluene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	79-00-5	
Trichloroethene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	79-01-6	
Trichlorofluoromethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	404	1	05/01/18 16:53	05/03/18 04:42	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	101	1	05/01/18 16:53	05/03/18 04:42	108-67-8	
Vinyl chloride	ND	ug/kg	40.4	1	05/01/18 16:53	05/03/18 04:42	75-01-4	
Xylene (Total)	ND	ug/kg	303	1	05/01/18 16:53	05/03/18 04:42	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:42	17060-07-0	
Toluene-d8 (S)	97	%.	75-125	1	05/01/18 16:53	05/03/18 04:42	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1	05/01/18 16:53	05/03/18 04:42	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	190	50	04/28/18 10:35	05/01/18 13:41	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	7.5	mg/kg	1.0	1		05/03/18 07:33	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	0.78	mg/kg	0.53	1	04/26/18 10:15	04/26/18 14:28	57-12-5	
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	0.99	1	04/27/18 12:45	04/30/18 19:17	16984-48-8	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 142287 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 562608 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.21	05/07/18 13:37	N3

METHOD BLANK: 562609 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.15	05/07/18 13:43	N3

METHOD BLANK: 562610 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.21	05/07/18 13:50	N3

LABORATORY CONTROL SAMPLE: 562611

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	100	113	112	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 562612 562613

Parameter	Units	10428096004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	359	372	373	444	104	119	65-135	17	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 535145 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2910764 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	05/02/18 11:15	
a,a,a-Trifluorotoluene (S)	%.	99	80-150	05/02/18 11:15	

LABORATORY CONTROL SAMPLE & LCSD: 2907780

Parameter	Units	2907781		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Gasoline Range Organics	mg/kg	50	40.4	81	84	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%.			99	99	80-150			

MATRIX SPIKE SAMPLE: 2910759

Parameter	Units	10427824002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	56.5	67.3	119	80-120	
a,a,a-Trifluorotoluene (S)	%.				98	80-150	

SAMPLE DUPLICATE: 2910758

Parameter	Units	10428096003 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	4.6J		20	
a,a,a-Trifluorotoluene (S)	%.	99	99	3		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533683

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898961

Matrix: Solid

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	04/24/18 15:54	

LABORATORY CONTROL SAMPLE: 2898962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.51	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898963 2898964

Parameter	Units	10428159001		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Mercury	mg/kg	0.097	.52	.51	0.65	0.62	105	103	80-120	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533686 Analysis Method: EPA 6010C
 QC Batch Method: EPA 3050 Analysis Description: 6010C Solids
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898973 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.3	04/26/18 13:37	
Barium	mg/kg	ND	0.47	04/26/18 13:37	
Boron	mg/kg	ND	7.0	04/26/18 13:37	
Copper	mg/kg	ND	0.47	04/26/18 13:37	
Iron	mg/kg	ND	2.3	04/26/18 13:37	
Manganese	mg/kg	ND	0.23	04/26/18 13:37	
Nickel	mg/kg	ND	0.93	04/26/18 13:37	
Silver	mg/kg	ND	0.47	04/26/18 13:37	
Tin	mg/kg	ND	3.5	04/26/18 13:37	
Titanium	mg/kg	ND	1.2	04/26/18 13:37	
Zinc	mg/kg	ND	0.93	04/26/18 13:37	

LABORATORY CONTROL SAMPLE: 2898974

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	971	965	99	80-120	
Barium	mg/kg	48.5	50.1	103	80-120	
Boron	mg/kg	48.5	44.5	92	80-120	
Copper	mg/kg	48.5	48.4	100	80-120	
Iron	mg/kg	971	983	101	80-120	
Manganese	mg/kg	48.5	49.9	103	80-120	
Nickel	mg/kg	48.5	48.5	100	80-120	
Silver	mg/kg	24.3	22.8	94	80-120	
Tin	mg/kg	48.5	48.8	100	80-120	
Titanium	mg/kg	48.5	49.1	101	80-120	
Zinc	mg/kg	48.5	47.4	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898975 2898976

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10428096001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Aluminum	mg/kg	24900	3380	3480	19400	40300	-165	441	75-125	70	20	P6,R1
Barium	mg/kg	428	169	174	408	498	-12	40	75-125	20	20	M1
Boron	mg/kg	109	169	174	229	285	71	101	75-125	22	20	M1,R1
Copper	mg/kg	448	169	174	446	1230	-1	452	75-125	94	20	M1,R1
Iron	mg/kg	166000	3380	3480	226000	163000	1800	-74	75-125	32	20	M6,R1
Manganese	mg/kg	596	169	174	887	870	172	158	75-125	2	20	M1
Nickel	mg/kg	62.5	169	174	223	235	95	99	75-125	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2898975		2898976		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
		10428096001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						MSD Result	RPD	
Silver	mg/kg	26.3	84.5	86.9	95.0	99.1	81	84	75-125	4	20		
Tin	mg/kg	406	169	174	601	743	116	194	75-125	21	20	M1, R1	
Titanium	mg/kg	208	169	174	430	468	131	149	75-125	9	20	M1	
Zinc	mg/kg	831	169	174	901	1010	42	105	75-125	12	20	P6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 438855 Analysis Method: EPA 6020
 QC Batch Method: EPA 3050B Analysis Description: 6020 MET
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2027873 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.19	04/26/18 02:38	N2

LABORATORY CONTROL SAMPLE: 2027874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.9	106	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027875 2027876

Parameter	Units	2027875		2027876		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	5.4	4.87	4.87	7.0	6.1	34	15	75-125	14	20 M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533687 Analysis Method: EPA 6020A
 QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898977 Matrix: Solid
 Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.49	04/24/18 18:20	
Arsenic	mg/kg	ND	0.49	04/24/18 18:20	
Beryllium	mg/kg	ND	0.19	04/24/18 18:20	
Cadmium	mg/kg	ND	0.078	04/24/18 18:20	
Cobalt	mg/kg	ND	0.49	04/24/18 18:20	
Lead	mg/kg	ND	0.097	04/24/18 18:20	
Lithium	mg/kg	ND	0.49	04/24/18 18:20	
Selenium	mg/kg	ND	0.49	04/24/18 18:20	
Strontium	mg/kg	ND	0.49	04/24/18 18:20	
Vanadium	mg/kg	ND	0.97	04/24/18 18:20	

LABORATORY CONTROL SAMPLE: 2898978

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	47.2	99	80-120	
Arsenic	mg/kg	47.6	46.8	98	80-120	
Beryllium	mg/kg	47.6	49.9	105	80-120	
Cadmium	mg/kg	47.6	47.0	99	80-120	
Cobalt	mg/kg	47.6	48.1	101	80-120	
Lead	mg/kg	47.6	49.6	104	80-120	
Lithium	mg/kg	47.6	52.3	110	80-120	
Selenium	mg/kg	47.6	48.6	102	80-120	
Strontium	mg/kg	47.6	48.0	101	80-120	
Vanadium	mg/kg	47.6	47.3	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898979 2898980

Parameter	Units	10428096001		2898979		2898980		% Rec	% Rec	% Rec	Max	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result					
Antimony	mg/kg	3.7	167	170	162	153	95	88	75-125	6	20	
Arsenic	mg/kg	11.9	167	170	200	181	113	99	75-125	10	20	
Beryllium	mg/kg	ND	167	170	195	181	116	106	75-125	8	20	
Cadmium	mg/kg	38.6	167	170	182	178	86	82	75-125	2	20	
Cobalt	mg/kg	8.4	167	170	214	187	123	105	75-125	13	20	
Lead	mg/kg	691	167	170	41400	4040	24300	1970	75-125	164	20	E, M6, R1
Lithium	mg/kg	2.4	167	170	205	191	121	111	75-125	7	20	
Selenium	mg/kg	1.8	167	170	175	166	104	96	75-125	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2898979		2898980		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Strontium	mg/kg	31.2	167	170	210	211	107	105	75-125	0	20		
Vanadium	mg/kg	40.2	167	170	200	211	96	100	75-125	5	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 534083

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10428096001, 10428096002

SAMPLE DUPLICATE: 2901467

Parameter	Units	10428393003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	20.6	20.4	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 535059

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10428096003, 10428096004, 10428096005

SAMPLE DUPLICATE: 2907119

Parameter	Units	10428896001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.9	8.3	5	30	

SAMPLE DUPLICATE: 2907120

Parameter	Units	10428133002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.0	11.9	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 535427 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2909873 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1,1-Trichloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1,2-Trichloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	05/02/18 18:51	
1,1-Dichloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,1-Dichloroethene	ug/kg	ND	50.0	05/02/18 18:51	
1,1-Dichloropropene	ug/kg	ND	50.0	05/02/18 18:51	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,2,3-Trichloropropane	ug/kg	ND	200	05/02/18 18:51	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	05/02/18 18:51	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	05/02/18 18:51	
1,2-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,2-Dichloroethane	ug/kg	ND	50.0	05/02/18 18:51	
1,2-Dichloropropane	ug/kg	ND	50.0	05/02/18 18:51	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,3-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
1,3-Dichloropropane	ug/kg	ND	50.0	05/02/18 18:51	
1,4-Dichlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
2,2-Dichloropropane	ug/kg	ND	200	05/02/18 18:51	
2-Butanone (MEK)	ug/kg	ND	250	05/02/18 18:51	
2-Chlorotoluene	ug/kg	ND	50.0	05/02/18 18:51	
4-Chlorotoluene	ug/kg	ND	50.0	05/02/18 18:51	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	05/02/18 18:51	
Acetone	ug/kg	ND	1000	05/02/18 18:51	
Allyl chloride	ug/kg	ND	200	05/02/18 18:51	
Benzene	ug/kg	ND	20.0	05/02/18 18:51	
Bromobenzene	ug/kg	ND	50.0	05/02/18 18:51	
Bromochloromethane	ug/kg	ND	50.0	05/02/18 18:51	
Bromodichloromethane	ug/kg	ND	50.0	05/02/18 18:51	
Bromoform	ug/kg	ND	200	05/02/18 18:51	
Bromomethane	ug/kg	ND	500	05/02/18 18:51	
Carbon tetrachloride	ug/kg	ND	50.0	05/02/18 18:51	
Chlorobenzene	ug/kg	ND	50.0	05/02/18 18:51	
Chloroethane	ug/kg	ND	500	05/02/18 18:51	
Chloroform	ug/kg	ND	50.0	05/02/18 18:51	
Chloromethane	ug/kg	ND	200	05/02/18 18:51	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	05/02/18 18:51	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	05/02/18 18:51	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

METHOD BLANK: 2909873

Matrix: Solid

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	05/02/18 18:51	
Dibromomethane	ug/kg	ND	50.0	05/02/18 18:51	
Dichlorodifluoromethane	ug/kg	ND	200	05/02/18 18:51	
Dichlorofluoromethane	ug/kg	ND	500	05/02/18 18:51	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	05/02/18 18:51	
Ethylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
Hexachloro-1,3-butadiene	ug/kg	ND	250	05/02/18 18:51	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	05/02/18 18:51	
Methyl-tert-butyl ether	ug/kg	ND	50.0	05/02/18 18:51	
Methylene Chloride	ug/kg	ND	200	05/02/18 18:51	
n-Butylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
n-Propylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
Naphthalene	ug/kg	ND	200	05/02/18 18:51	
p-Isopropyltoluene	ug/kg	ND	50.0	05/02/18 18:51	
sec-Butylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
Styrene	ug/kg	ND	50.0	05/02/18 18:51	
tert-Butylbenzene	ug/kg	ND	50.0	05/02/18 18:51	
Tetrachloroethene	ug/kg	ND	50.0	05/02/18 18:51	
Tetrahydrofuran	ug/kg	ND	2000	05/02/18 18:51	
Toluene	ug/kg	ND	50.0	05/02/18 18:51	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	05/02/18 18:51	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	05/02/18 18:51	
Trichloroethene	ug/kg	ND	50.0	05/02/18 18:51	
Trichlorofluoromethane	ug/kg	ND	200	05/02/18 18:51	
Vinyl chloride	ug/kg	ND	20.0	05/02/18 18:51	
Xylene (Total)	ug/kg	ND	150	05/02/18 18:51	
1,2-Dichloroethane-d4 (S)	%	99	75-125	05/02/18 18:51	
4-Bromofluorobenzene (S)	%	98	75-125	05/02/18 18:51	
Toluene-d8 (S)	%	99	75-125	05/02/18 18:51	

LABORATORY CONTROL SAMPLE & LCSD: 2909874

2909875

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	914	897	91	90	59-125	2	20	
1,1,1-Trichloroethane	ug/kg	1000	898	976	90	98	59-125	8	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	901	920	90	92	58-125	2	20	
1,1,2-Trichloroethane	ug/kg	1000	889	909	89	91	64-125	2	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	852	881	85	88	65-125	3	20	
1,1-Dichloroethane	ug/kg	1000	883	930	88	93	63-125	5	20	
1,1-Dichloroethene	ug/kg	1000	830	873	83	87	59-125	5	20	
1,1-Dichloropropene	ug/kg	1000	866	942	87	94	64-125	8	20	
1,2,3-Trichlorobenzene	ug/kg	1000	927	953	93	95	55-126	3	20	
1,2,3-Trichloropropane	ug/kg	1000	943	948	94	95	62-125	1	20	
1,2,4-Trichlorobenzene	ug/kg	1000	941	939	94	94	62-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE & LCSD: 2909874

2909875

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	944	928	94	93	59-125	2	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2370	2440	95	98	54-125	3	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	852	919	85	92	64-125	8	20	
1,2-Dichlorobenzene	ug/kg	1000	859	884	86	88	63-125	3	20	
1,2-Dichloroethane	ug/kg	1000	836	819	84	82	57-125	2	20	
1,2-Dichloropropane	ug/kg	1000	884	908	88	91	67-125	3	20	
1,3,5-Trimethylbenzene	ug/kg	1000	914	913	91	91	59-125	0	20	
1,3-Dichlorobenzene	ug/kg	1000	898	883	90	88	64-125	2	20	
1,3-Dichloropropane	ug/kg	1000	864	880	86	88	64-125	2	20	
1,4-Dichlorobenzene	ug/kg	1000	886	881	89	88	63-125	1	20	
2,2-Dichloropropane	ug/kg	1000	845	916	84	92	37-126	8	20	
2-Butanone (MEK)	ug/kg	5000	3880	4310	78	86	48-125	10	20	
2-Chlorotoluene	ug/kg	1000	878	881	88	88	62-125	0	20	
4-Chlorotoluene	ug/kg	1000	904	908	90	91	63-125	0	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4550	4650	91	93	52-135	2	20	
Acetone	ug/kg	5000	4580	4400	92	88	65-125	4	20	
Allyl chloride	ug/kg	1000	825	855	82	86	52-125	4	20	
Benzene	ug/kg	1000	936	916	94	92	61-125	2	20	
Bromobenzene	ug/kg	1000	922	938	92	94	64-125	2	20	
Bromochloromethane	ug/kg	1000	871	952	87	95	65-125	9	20	
Bromodichloromethane	ug/kg	1000	936	941	94	94	57-125	1	20	
Bromoform	ug/kg	1000	790	822	79	82	57-125	4	20	
Bromomethane	ug/kg	1000	993	1020	99	102	60-125	3	20	
Carbon tetrachloride	ug/kg	1000	890	972	89	97	58-125	9	20	
Chlorobenzene	ug/kg	1000	917	925	92	92	66-125	1	20	
Chloroethane	ug/kg	1000	751	825	75	82	62-125	9	20	
Chloroform	ug/kg	1000	827	932	83	93	59-125	12	20	
Chloromethane	ug/kg	1000	731	793	73	79	50-125	8	20	
cis-1,2-Dichloroethene	ug/kg	1000	854	904	85	90	61-125	6	20	
cis-1,3-Dichloropropene	ug/kg	1000	927	967	93	97	61-125	4	20	
Dibromochloromethane	ug/kg	1000	894	902	89	90	60-125	1	20	
Dibromomethane	ug/kg	1000	886	904	89	90	69-125	2	20	
Dichlorodifluoromethane	ug/kg	1000	517	551	52	55	38-125	6	20	
Dichlorofluoromethane	ug/kg	1000	826	927	83	93	67-125	12	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	2330	3490	233	349	60-125	40	20	L3,R1
Ethylbenzene	ug/kg	1000	918	930	92	93	62-125	1	20	
Hexachloro-1,3-butadiene	ug/kg	1000	930	947	93	95	56-125	2	20	
Isopropylbenzene (Cumene)	ug/kg	1000	958	961	96	96	65-125	0	20	
Methyl-tert-butyl ether	ug/kg	1000	818	876	82	88	59-125	7	20	
Methylene Chloride	ug/kg	1000	793	871	79	87	64-125	9	20	
n-Butylbenzene	ug/kg	1000	916	951	92	95	59-125	4	20	
n-Propylbenzene	ug/kg	1000	953	906	95	91	61-125	5	20	
Naphthalene	ug/kg	1000	914	934	91	93	53-125	2	20	
p-Isopropyltoluene	ug/kg	1000	927	947	93	95	63-125	2	20	
sec-Butylbenzene	ug/kg	1000	895	923	89	92	62-125	3	20	
Styrene	ug/kg	1000	925	931	92	93	66-125	1	20	
tert-Butylbenzene	ug/kg	1000	974	973	97	97	64-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE & LCSD: 2909874

Parameter	Units	2909875		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Tetrachloroethene	ug/kg	1000	919	913	92	91	67-125	1	20
Tetrahydrofuran	ug/kg	10000	8930	9280	89	93	62-125	4	20
Toluene	ug/kg	1000	904	896	90	90	61-125	1	20
trans-1,2-Dichloroethene	ug/kg	1000	824	845	82	84	64-125	3	20
trans-1,3-Dichloropropene	ug/kg	1000	887	907	89	91	56-125	2	20
Trichloroethene	ug/kg	1000	887	888	89	89	67-125	0	20
Trichlorofluoromethane	ug/kg	1000	764	815	76	81	65-125	6	20
Vinyl chloride	ug/kg	1000	733	779	73	78	57-125	6	20
Xylene (Total)	ug/kg	3000	2680	2740	89	91	62-125	2	20
1,2-Dichloroethane-d4 (S)	%				99	97	75-125		
4-Bromofluorobenzene (S)	%				102	102	75-125		
Toluene-d8 (S)	%				99	100	75-125		

MATRIX SPIKE SAMPLE: 2909876

Parameter	Units	10429252001		MS Result	MS % Rec	% Rec Limits	Qualifiers
		Result	Spike Conc.				
1,1,1,2-Tetrachloroethane	ug/kg	ND	2120	2260	106	64-146	
1,1,1-Trichloroethane	ug/kg	ND	2120	2360	111	56-148	
1,1,2,2-Tetrachloroethane	ug/kg	ND	2120	2330	110	36-150	
1,1,2-Trichloroethane	ug/kg	ND	2120	2180	102	67-148	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	2120	2300	108	60-142	
1,1-Dichloroethane	ug/kg	ND	2120	2280	107	57-140	
1,1-Dichloroethene	ug/kg	ND	2120	2170	102	59-139	
1,1-Dichloropropene	ug/kg	ND	2120	2290	108	61-142	
1,2,3-Trichlorobenzene	ug/kg	ND	2120	2390	113	69-150	
1,2,3-Trichloropropane	ug/kg	ND	2120	2420	114	64-150	
1,2,4-Trichlorobenzene	ug/kg	ND	2120	2440	115	71-149	
1,2,4-Trimethylbenzene	ug/kg	ND	2120	2320	109	67-149	
1,2-Dibromo-3-chloropropane	ug/kg	ND	5310	6340	119	61-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	2120	2160	102	67-147	
1,2-Dichlorobenzene	ug/kg	ND	2120	2210	104	70-142	
1,2-Dichloroethane	ug/kg	ND	2120	2190	103	58-132	
1,2-Dichloropropane	ug/kg	ND	2120	2140	101	64-144	
1,3,5-Trimethylbenzene	ug/kg	ND	2120	2290	108	71-146	
1,3-Dichlorobenzene	ug/kg	ND	2120	2210	104	71-142	
1,3-Dichloropropane	ug/kg	ND	2120	2120	100	68-140	
1,4-Dichlorobenzene	ug/kg	ND	2120	2250	106	68-142	
2,2-Dichloropropane	ug/kg	ND	2120	2260	106	34-150	
2-Butanone (MEK)	ug/kg	ND	10600	10200	96	51-150	
2-Chlorotoluene	ug/kg	ND	2120	2230	105	66-144	
4-Chlorotoluene	ug/kg	ND	2120	2240	105	66-140	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	10600	11400	107	63-150	
Acetone	ug/kg	ND	10600	10100	95	54-150	
Allyl chloride	ug/kg	ND	2120	2120	100	53-135	
Benzene	ug/kg	ND	2120	2160	102	65-135	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

MATRIX SPIKE SAMPLE: 2909876		10429252001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	2120	2350	111	71-141	
Bromochloromethane	ug/kg	ND	2120	2230	105	62-145	
Bromodichloromethane	ug/kg	ND	2120	2300	108	59-148	
Bromoform	ug/kg	ND	2120	2080	98	57-145	
Bromomethane	ug/kg	ND	16.4	925	5110	51-129	1M,M1
Carbon tetrachloride	ug/kg	ND	2120	2410	113	55-144	
Chlorobenzene	ug/kg	ND	2120	2240	105	70-142	
Chloroethane	ug/kg	ND	16.4	ND	0	61-135	1M,M1
Chloroform	ug/kg	ND	2120	2180	103	58-135	
Chloromethane	ug/kg	ND	16.4	80.5J	343	37-125	1M,M1
cis-1,2-Dichloroethene	ug/kg	ND	2120	2150	101	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	2120	2240	105	62-142	
Dibromochloromethane	ug/kg	ND	2120	2260	107	65-141	
Dibromomethane	ug/kg	ND	2120	2110	100	72-150	
Dichlorodifluoromethane	ug/kg	ND	16.4	ND	0	30-125	1M,M1
Dichlorofluoromethane	ug/kg	ND	16.4	ND	0	62-148	1M,M1
Diethyl ether (Ethyl ether)	ug/kg	ND	2120	11700	549	62-135	M0
Ethylbenzene	ug/kg	ND	2120	2230	105	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	2120	3030	143	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	2120	2360	111	75-148	
Methyl-tert-butyl ether	ug/kg	ND	2120	2220	104	63-139	
Methylene Chloride	ug/kg	ND	2120	2070	97	58-135	
n-Butylbenzene	ug/kg	ND	2120	2430	114	63-150	
n-Propylbenzene	ug/kg	ND	2120	2350	110	70-146	
Naphthalene	ug/kg	ND	2120	2350	111	63-150	
p-Isopropyltoluene	ug/kg	ND	2120	2360	111	72-150	
sec-Butylbenzene	ug/kg	ND	2120	2370	112	66-150	
Styrene	ug/kg	ND	2120	2270	107	72-146	
tert-Butylbenzene	ug/kg	ND	2120	2460	116	71-148	
Tetrachloroethene	ug/kg	ND	2120	2190	103	70-150	
Tetrahydrofuran	ug/kg	ND	21200	21300	100	62-150	
Toluene	ug/kg	ND	2120	2170	102	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	2120	2120	100	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	2120	2210	104	57-147	
Trichloroethene	ug/kg	ND	2120	2220	104	62-150	
Trichlorofluoromethane	ug/kg	ND	16.4	ND	0	51-150	1M,M1
Vinyl chloride	ug/kg	ND	16.4	ND	0	45-132	1M,M1
Xylene (Total)	ug/kg	ND	6370	6570	103	75-140	
1,2-Dichloroethane-d4 (S)	%				109	75-125	C0
4-Bromofluorobenzene (S)	%				103	75-125	
Toluene-d8 (S)	%				99	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

SAMPLE DUPLICATE: 2909877

Parameter	Units	10428096001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	133J		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	41.4J		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	175	209	18	30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	613		30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

SAMPLE DUPLICATE: 2909877

Parameter	Units	10428096001 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	98.8J		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	83.3J		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	49.7J		30	
Styrene	ug/kg	219	111J		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	178	352	65	30	D6
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	185		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	469J		30	
1,2-Dichloroethane-d4 (S)	%.	96	99	1		C0
4-Bromofluorobenzene (S)	%.	100	99	5		
Toluene-d8 (S)	%.	96	96	4		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533571 Analysis Method: EPA 8081B
QC Batch Method: EPA 3550 Analysis Description: 8081S GCS Pesticides
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898364 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	05/01/18 19:18	
4,4'-DDE	ug/kg	ND	3.3	05/01/18 19:18	
4,4'-DDT	ug/kg	ND	3.3	05/01/18 19:18	
Aldrin	ug/kg	ND	1.7	05/01/18 19:18	
alpha-BHC	ug/kg	ND	1.7	05/01/18 19:18	
alpha-Chlordane	ug/kg	ND	1.7	05/01/18 19:18	
beta-BHC	ug/kg	ND	1.7	05/01/18 19:18	
Chlordane (Technical)	ug/kg	ND	16.7	05/01/18 19:18	
delta-BHC	ug/kg	ND	1.7	05/01/18 19:18	
Dieldrin	ug/kg	ND	3.3	05/01/18 19:18	
Endosulfan I	ug/kg	ND	1.7	05/01/18 19:18	
Endosulfan II	ug/kg	ND	3.3	05/01/18 19:18	
Endosulfan sulfate	ug/kg	ND	3.3	05/01/18 19:18	
Endrin	ug/kg	ND	3.3	05/01/18 19:18	
Endrin aldehyde	ug/kg	ND	3.3	05/01/18 19:18	
Endrin ketone	ug/kg	ND	3.3	05/01/18 19:18	
gamma-BHC (Lindane)	ug/kg	ND	1.7	05/01/18 19:18	
gamma-Chlordane	ug/kg	ND	1.7	05/01/18 19:18	
Heptachlor	ug/kg	ND	1.7	05/01/18 19:18	
Heptachlor epoxide	ug/kg	ND	1.7	05/01/18 19:18	
Methoxychlor	ug/kg	ND	16.7	05/01/18 19:18	
Toxaphene	ug/kg	ND	50.0	05/01/18 19:18	
Decachlorobiphenyl (S)	%	85	30-150	05/01/18 19:18	
Tetrachloro-m-xylene (S)	%	95	30-150	05/01/18 19:18	

LABORATORY CONTROL SAMPLE: 2898365

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	32.1	96	62-127	
4,4'-DDE	ug/kg	33.3	31.5	94	66-125	
4,4'-DDT	ug/kg	33.3	29.4	88	67-128	
Aldrin	ug/kg	16.7	15.6	93	66-125	
alpha-BHC	ug/kg	16.7	16.4	98	64-125	
alpha-Chlordane	ug/kg	16.7	15.8	95	68-125	
beta-BHC	ug/kg	16.7	15.9	96	69-125	
delta-BHC	ug/kg	16.7	12.8	77	42-133	
Dieldrin	ug/kg	33.3	33.5	100	69-126	
Endosulfan I	ug/kg	16.7	14.8	89	63-125	
Endosulfan II	ug/kg	33.3	32.6	98	69-125	
Endosulfan sulfate	ug/kg	33.3	28.3	85	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE: 2898365

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	31.3	94	69-125	
Endrin aldehyde	ug/kg	33.3	30.8	92	65-125	
Endrin ketone	ug/kg	33.3	32.6	98	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	16.3	98	67-125	
gamma-Chlordane	ug/kg	16.7	13.1	78	63-125	
Heptachlor	ug/kg	16.7	16.1	97	69-125	
Heptachlor epoxide	ug/kg	16.7	16.0	96	68-125	
Methoxychlor	ug/kg	167	145	87	65-134	
Decachlorobiphenyl (S)	%			87	30-150	
Tetrachloro-m-xylene (S)	%			98	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898412 2898413

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10428096004 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
4,4'-DDD	ug/kg	ND	51.7	51.7	67.6	58.4	131	113	56-125	15	20	M1
4,4'-DDE	ug/kg	ND	51.7	51.7	50.4	57.9	98	112	32-150	14	20	
4,4'-DDT	ug/kg	ND	51.7	51.7	56.5	57.6	109	112	60-132	2	20	
Aldrin	ug/kg	ND	25.8	25.8	29.8	25.8	115	100	56-125	14	20	
alpha-BHC	ug/kg	ND	25.8	25.8	24.4	25.4	94	98	54-136	4	20	
alpha-Chlordane	ug/kg	ND	25.8	25.8	27.7	29.7	107	115	54-133	7	20	
beta-BHC	ug/kg	18.5	25.8	25.8	27.6	27.4	35	34	30-150	1	20	
delta-BHC	ug/kg	ND	25.8	25.8	19.8	19.9	77	77	45-145	0	20	
Dieldrin	ug/kg	ND	51.7	51.7	54.7	54.3	106	105	47-150	1	20	
Endosulfan I	ug/kg	22.0	25.8	25.8	27.9	26.5	23	17	35-145	5	20	M1
Endosulfan II	ug/kg	ND	51.7	51.7	51.2	52.0	99	101	50-147	2	20	
Endosulfan sulfate	ug/kg	ND	51.7	51.7	44.4	45.5	86	88	54-132	3	20	
Endrin	ug/kg	ND	51.7	51.7	47.1	46.9	91	91	62-125	0	20	
Endrin aldehyde	ug/kg	ND	51.7	51.7	55.2	50.3	107	97	33-150	9	20	
Endrin ketone	ug/kg	ND	51.7	51.7	55.0	53.0	106	103	56-144	4	20	
gamma-BHC (Lindane)	ug/kg	ND	25.8	25.8	31.0	37.8	120	146	63-125	20	20	M1
gamma-Chlordane	ug/kg	ND	25.8	25.8	22.6	24.1	88	93	45-132	6	20	
Heptachlor	ug/kg	ND	25.8	25.8	24.5	25.9	95	100	51-142	6	20	
Heptachlor epoxide	ug/kg	19.9	25.8	25.8	26.0	26.9	24	27	50-142	4	20	M1
Methoxychlor	ug/kg	ND	258	258	302	299	117	116	58-139	1	20	
Decachlorobiphenyl (S)	%						85	92	30-150			
Tetrachloro-m-xylene (S)	%						85	90	30-150			2M,D4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533570 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898360 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/24/18 14:38	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/24/18 14:38	
Decachlorobiphenyl (S)	%	122	30-134	04/24/18 14:38	CH
Tetrachloro-m-xylene (S)	%	83	48-125	04/24/18 14:38	

LABORATORY CONTROL SAMPLE: 2898361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	501	75	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	547	82	62-125	
Decachlorobiphenyl (S)	%			124	30-134	CH
Tetrachloro-m-xylene (S)	%			86	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898410 2898411

Parameter	Units	10428096003		2898410		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
PCB-1016 (Aroclor 1016)	ug/kg	ND	901	901	864	893	96	99	30-150	3	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	901	901	776	840	86	93	30-138	8	30	
Decachlorobiphenyl (S)	%						111	118	30-134			CH
Tetrachloro-m-xylene (S)	%						83	86	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533569 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898356 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/25/18 18:45	
1,2-Dichlorobenzene	ug/kg	ND	330	04/25/18 18:45	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/25/18 18:45	
1,3-Dichlorobenzene	ug/kg	ND	330	04/25/18 18:45	
1,4-Dichlorobenzene	ug/kg	ND	330	04/25/18 18:45	
1-Methylnaphthalene	ug/kg	ND	330	04/25/18 18:45	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/25/18 18:45	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/25/18 18:45	
2,4-Dichlorophenol	ug/kg	ND	330	04/25/18 18:45	
2,4-Dimethylphenol	ug/kg	ND	330	04/25/18 18:45	
2,4-Dinitrophenol	ug/kg	ND	330	04/25/18 18:45	
2,4-Dinitrotoluene	ug/kg	ND	330	04/25/18 18:45	
2,6-Dinitrotoluene	ug/kg	ND	330	04/25/18 18:45	
2-Chloronaphthalene	ug/kg	ND	330	04/25/18 18:45	
2-Chlorophenol	ug/kg	ND	330	04/25/18 18:45	
2-Methylnaphthalene	ug/kg	ND	330	04/25/18 18:45	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/25/18 18:45	
2-Nitroaniline	ug/kg	ND	330	04/25/18 18:45	
2-Nitrophenol	ug/kg	ND	330	04/25/18 18:45	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/25/18 18:45	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/25/18 18:45	
3-Nitroaniline	ug/kg	ND	330	04/25/18 18:45	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/25/18 18:45	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/25/18 18:45	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/25/18 18:45	
4-Chloroaniline	ug/kg	ND	330	04/25/18 18:45	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/25/18 18:45	
4-Nitroaniline	ug/kg	ND	330	04/25/18 18:45	
4-Nitrophenol	ug/kg	ND	330	04/25/18 18:45	
Acenaphthene	ug/kg	ND	330	04/25/18 18:45	
Acenaphthylene	ug/kg	ND	330	04/25/18 18:45	
Anthracene	ug/kg	ND	330	04/25/18 18:45	
Benzo(a)anthracene	ug/kg	ND	330	04/25/18 18:45	
Benzo(a)pyrene	ug/kg	ND	330	04/25/18 18:45	
Benzo(b)fluoranthene	ug/kg	ND	330	04/25/18 18:45	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/25/18 18:45	
Benzo(k)fluoranthene	ug/kg	ND	330	04/25/18 18:45	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/25/18 18:45	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/25/18 18:45	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/25/18 18:45	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/25/18 18:45	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

METHOD BLANK: 2898356

Matrix: Solid

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/25/18 18:45	
Carbazole	ug/kg	ND	330	04/25/18 18:45	
Chrysene	ug/kg	ND	330	04/25/18 18:45	
Di-n-butylphthalate	ug/kg	ND	330	04/25/18 18:45	
Di-n-octylphthalate	ug/kg	ND	330	04/25/18 18:45	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/25/18 18:45	
Dibenzofuran	ug/kg	ND	330	04/25/18 18:45	
Diethylphthalate	ug/kg	ND	330	04/25/18 18:45	
Dimethylphthalate	ug/kg	ND	330	04/25/18 18:45	
Fluoranthene	ug/kg	ND	330	04/25/18 18:45	
Fluorene	ug/kg	ND	330	04/25/18 18:45	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/25/18 18:45	
Hexachlorobenzene	ug/kg	ND	330	04/25/18 18:45	
Hexachloroethane	ug/kg	ND	330	04/25/18 18:45	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/25/18 18:45	
Isophorone	ug/kg	ND	330	04/25/18 18:45	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/25/18 18:45	
N-Nitrosodimethylamine	ug/kg	ND	330	04/25/18 18:45	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/25/18 18:45	
Naphthalene	ug/kg	ND	330	04/25/18 18:45	
Nitrobenzene	ug/kg	ND	330	04/25/18 18:45	
Pentachlorophenol	ug/kg	ND	670	04/25/18 18:45	
Phenanthrene	ug/kg	ND	330	04/25/18 18:45	
Phenol	ug/kg	ND	330	04/25/18 18:45	
Pyrene	ug/kg	ND	330	04/25/18 18:45	
2,4,6-Tribromophenol (S)	%	73	60-125	04/25/18 18:45	
2-Fluorobiphenyl (S)	%	71	30-132	04/25/18 18:45	
2-Fluorophenol (S)	%	69	40-125	04/25/18 18:45	
Nitrobenzene-d5 (S)	%	68	43-125	04/25/18 18:45	
p-Terphenyl-d14 (S)	%	86	62-125	04/25/18 18:45	
Phenol-d6 (S)	%	67	48-125	04/25/18 18:45	

LABORATORY CONTROL SAMPLE: 2898357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1250	75	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1280	77	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1360	82	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1260	76	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1280	77	39-125	
1-Methylnaphthalene	ug/kg	1670	1310	79	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1400	84	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1390	83	61-125	
2,4-Dichlorophenol	ug/kg	1670	1380	83	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE: 2898357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1310	78	51-125	
2,4-Dinitrophenol	ug/kg	1670	1250	75	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1620	97	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1540	93	63-125	
2-Chloronaphthalene	ug/kg	1670	1360	82	61-125	
2-Chlorophenol	ug/kg	1670	1340	81	46-125	
2-Methylnaphthalene	ug/kg	1670	1320	79	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1320	79	50-125	
2-Nitroaniline	ug/kg	1670	1410	84	61-125	
2-Nitrophenol	ug/kg	1670	1380	83	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1350	81	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1520	91	47-125	
3-Nitroaniline	ug/kg	1670	1440	86	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1570J	94	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1410	85	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1460	88	64-125	
4-Chloroaniline	ug/kg	1670	1160	69	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1380	83	64-125	
4-Nitroaniline	ug/kg	1670	1430	86	59-125	
4-Nitrophenol	ug/kg	1670	1350	81	54-125	
Acenaphthene	ug/kg	1670	1360	82	62-125	
Acenaphthylene	ug/kg	1670	1360	82	61-125	
Anthracene	ug/kg	1670	1450	87	66-125	
Benzo(a)anthracene	ug/kg	1670	1490	89	69-125	
Benzo(a)pyrene	ug/kg	1670	1470	88	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1510	90	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1550	93	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1470	88	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1270	76	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1220	73	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1100	66	37-125 4M	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1730	104	69-131	
Butylbenzylphthalate	ug/kg	1670	1680	101	69-129	
Carbazole	ug/kg	1670	1530	92	66-125	
Chrysene	ug/kg	1670	1510	91	68-125	
Di-n-butylphthalate	ug/kg	1670	1620	97	69-125	
Di-n-octylphthalate	ug/kg	1670	1750	105	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1570	94	64-125	
Dibenzofuran	ug/kg	1670	1420	85	65-125	
Diethylphthalate	ug/kg	1670	1510	90	67-125	
Dimethylphthalate	ug/kg	1670	1480	89	67-125	
Fluoranthene	ug/kg	1670	1490	89	66-125	
Fluorene	ug/kg	1670	1400	84	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1230	74	40-125	
Hexachlorobenzene	ug/kg	1670	1440	86	62-125	
Hexachloroethane	ug/kg	1670	1290	78	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1560	93	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

LABORATORY CONTROL SAMPLE: 2898357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1310	79	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1320	79	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1290	77	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1490	89	65-125	
Naphthalene	ug/kg	1670	1280	77	48-125	
Nitrobenzene	ug/kg	1670	1270	76	48-125	
Pentachlorophenol	ug/kg	1670	1050	63	41-125	
Phenanthrene	ug/kg	1670	1430	86	66-125	
Phenol	ug/kg	1670	1270	76	46-125	
Pyrene	ug/kg	1670	1550	93	69-125	
2,4,6-Tribromophenol (S)	%			82	60-125	
2-Fluorobiphenyl (S)	%			73	30-132	
2-Fluorophenol (S)	%			73	40-125	
Nitrobenzene-d5 (S)	%			69	43-125	
p-Terphenyl-d14 (S)	%			89	62-125	
Phenol-d6 (S)	%			71	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898403 2898404

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10428096002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	2240	2220	1700	1760	76	79	30-127	4	30	
1,2-Dichlorobenzene	ug/kg	ND	2240	2220	1720	1740	77	79	30-125	1	30	
1,2-Diphenylhydrazine	ug/kg	ND	2240	2220	1800	1770	81	80	30-150	2	30	
1,3-Dichlorobenzene	ug/kg	ND	2240	2220	1690	1730	76	78	30-125	2	30	
1,4-Dichlorobenzene	ug/kg	ND	2240	2220	1710	1720	77	77	30-125	0	30	
1-Methylnaphthalene	ug/kg	ND	2240	2220	1780	1790	80	81	42-125	1	30	
2,4,5-Trichlorophenol	ug/kg	ND	2240	2220	1780	1740	80	78	30-150	2	30	
2,4,6-Trichlorophenol	ug/kg	ND	2240	2220	1790	1770	80	80	30-150	1	30	
2,4-Dichlorophenol	ug/kg	ND	2240	2220	1880	1850	84	83	30-135	2	30	
2,4-Dimethylphenol	ug/kg	ND	2240	2220	1590	1670	71	75	30-148	5	30	
2,4-Dinitrophenol	ug/kg	ND	2240	2220	808	817	36	37	30-125	1	30	
2,4-Dinitrotoluene	ug/kg	ND	2240	2220	2090	2040	94	92	30-150	3	30	
2,6-Dinitrotoluene	ug/kg	ND	2240	2220	1980	1960	89	88	30-150	1	30	
2-Chloronaphthalene	ug/kg	ND	2240	2220	1820	1800	82	81	30-138	1	30	
2-Chlorophenol	ug/kg	ND	2240	2220	1780	1810	80	82	30-130	2	30	
2-Methylnaphthalene	ug/kg	ND	2240	2220	1760	1780	79	80	46-125	1	30	
2-Methylphenol(o-Cresol)	ug/kg	ND	2240	2220	1740	1750	78	79	30-133	1	30	
2-Nitroaniline	ug/kg	ND	2240	2220	1890	1870	85	84	30-150	1	30	
2-Nitrophenol	ug/kg	ND	2240	2220	1850	1930	83	87	30-134	4	30	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	2240	2220	1830	1820	82	82	30-138	0	30	
3,3'-Dichlorobenzidine	ug/kg	ND	2240	2220	1930	2080	87	94	30-149	8	30	
3-Nitroaniline	ug/kg	ND	2240	2220	1820	1920	82	87	30-150	6	30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	2240	2220	1450J	1440J	65	65	30-133		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898403												2898404											
Parameter	Units	MS		MSD		MS		MSD		% Rec		Max		Qual									
		10428096002	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD												
4-Bromophenylphenyl ether	ug/kg	ND	2240	2220	1830	1790	82	81	44-125	2	30												
4-Chloro-3-methylphenol	ug/kg	ND	2240	2220	1910	1880	85	85	30-150	1	30												
4-Chloroaniline	ug/kg	ND	2240	2220	1280	1500	58	68	30-125	16	30												
4-Chlorophenylphenyl ether	ug/kg	ND	2240	2220	1790	1790	80	81	44-125	0	30												
4-Nitroaniline	ug/kg	ND	2240	2220	1770	1860	79	84	30-150	5	30												
4-Nitrophenol	ug/kg	ND	2240	2220	1740	1730	78	78	30-150	1	30												
Acenaphthene	ug/kg	ND	2240	2220	1750	1730	79	78	40-125	1	30												
Acenaphthylene	ug/kg	ND	2240	2220	1830	1790	82	81	30-150	2	30												
Anthracene	ug/kg	ND	2240	2220	1860	1850	83	83	30-150	0	30												
Benzo(a)anthracene	ug/kg	ND	2240	2220	1900	1900	85	86	30-150	0	30												
Benzo(a)pyrene	ug/kg	ND	2240	2220	1960	1900	88	86	30-150	3	30												
Benzo(b)fluoranthene	ug/kg	ND	2240	2220	1980	1920	89	87	30-150	3	30												
Benzo(g,h,i)perylene	ug/kg	ND	2240	2220	1970	1890	88	85	30-150	4	30												
Benzo(k)fluoranthene	ug/kg	ND	2240	2220	1950	1890	88	85	30-150	4	30												
bis(2-Chloroethoxy)methane	ug/kg	ND	2240	2220	1750	1750	79	79	30-134	0	30												
bis(2-Chloroethyl) ether	ug/kg	ND	2240	2220	1740	1730	78	78	30-125	0	30												
bis(2-Chloroisopropyl) ether	ug/kg	ND	2240	2220	1560	1580	70	71	30-125	1	30												
bis(2-Ethylhexyl)phthalate	ug/kg	ND	2240	2220	2230	2200	100	99	30-150	2	30												
Butylbenzylphthalate	ug/kg	ND	2240	2220	2130	2120	96	95	30-150	1	30												
Carbazole	ug/kg	ND	2240	2220	2000	1940	89	87	41-125	3	30												
Chrysene	ug/kg	ND	2240	2220	1930	1890	87	85	30-150	3	30												
Di-n-butylphthalate	ug/kg	ND	2240	2220	2050	2060	92	93	30-150	0	30												
Di-n-octylphthalate	ug/kg	ND	2240	2220	2260	2220	102	100	30-150	2	30												
Dibenz(a,h)anthracene	ug/kg	ND	2240	2220	2010	1960	90	88	30-150	3	30												
Dibenzofuran	ug/kg	ND	2240	2220	1830	1810	82	81	45-125	1	30												
Diethylphthalate	ug/kg	ND	2240	2220	1930	1920	87	86	30-150	1	30												
Dimethylphthalate	ug/kg	ND	2240	2220	1930	1880	86	85	30-150	2	30												
Fluoranthene	ug/kg	ND	2240	2220	1920	1910	86	86	30-150	1	30												
Fluorene	ug/kg	ND	2240	2220	1840	1820	82	82	30-150	1	30												
Hexachloro-1,3-butadiene	ug/kg	ND	2240	2220	1630	1680	73	76	30-128	3	30												
Hexachlorobenzene	ug/kg	ND	2240	2220	1850	1830	83	82	30-150	1	30												
Hexachloroethane	ug/kg	ND	2240	2220	1610	1630	72	74	30-125	2	30												
Indeno(1,2,3-cd)pyrene	ug/kg	ND	2240	2220	1990	1930	89	87	30-150	3	30												
Isophorone	ug/kg	ND	2240	2220	1760	1790	79	81	30-140	2	30												
N-Nitroso-di-n-propylamine	ug/kg	ND	2240	2220	1780	1820	80	82	30-147	2	30												
N-Nitrosodimethylamine	ug/kg	ND	2240	2220	1700	1740	76	78	30-125	2	30												
N-Nitrosodiphenylamine	ug/kg	ND	2240	2220	1930	1920	87	86	30-150	1	30												
Naphthalene	ug/kg	ND	2240	2220	1740	1770	78	80	44-125	2	30												
Nitrobenzene	ug/kg	ND	2240	2220	1740	1790	78	80	30-136	3	30												
Pentachlorophenol	ug/kg	ND	2240	2220	1070	1110	48	50	30-150	3	30												
Phenanthrene	ug/kg	ND	2240	2220	1850	1840	83	83	30-150	1	30												
Phenol	ug/kg	ND	2240	2220	1760	1750	79	79	30-129	1	30												
Pyrene	ug/kg	ND	2240	2220	1980	1940	89	87	30-150	2	30												
2,4,6-Tribromophenol (S)	%						78	78	60-125														
2-Fluorobiphenyl (S)	%						74	73	30-132														
2-Fluorophenol (S)	%						73	74	40-125														

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2898403		2898404		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					70	72	43-125			
p-Terphenyl-d14 (S)	%.					85	84	62-125			
Phenol-d6 (S)	%.					73	72	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 533524 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10428096005

METHOD BLANK: 2898117 Matrix: Solid
Associated Lab Samples: 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/24/18 12:08	
Acenaphthylene	ug/kg	ND	10.0	04/24/18 12:08	
Anthracene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(a)anthracene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(a)pyrene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/24/18 12:08	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/24/18 12:08	
Chrysene	ug/kg	ND	10.0	04/24/18 12:08	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/24/18 12:08	
Fluoranthene	ug/kg	ND	10.0	04/24/18 12:08	
Fluorene	ug/kg	ND	10.0	04/24/18 12:08	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/24/18 12:08	
Naphthalene	ug/kg	ND	10.0	04/24/18 12:08	
Phenanthrene	ug/kg	ND	10.0	04/24/18 12:08	
Pyrene	ug/kg	ND	10.0	04/24/18 12:08	
2-Fluorobiphenyl (S)	%	63	42-125	04/24/18 12:08	
p-Terphenyl-d14 (S)	%	89	57-125	04/24/18 12:08	

LABORATORY CONTROL SAMPLE: 2898118

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	24.7	74	52-125	
Acenaphthylene	ug/kg	33.3	23.8	71	50-125	
Anthracene	ug/kg	33.3	31.6	95	65-125	
Benzo(a)anthracene	ug/kg	33.3	26.7	80	60-125	
Benzo(a)pyrene	ug/kg	33.3	29.0	87	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	27.2	82	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	29.0	87	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	30.2	91	67-125	
Chrysene	ug/kg	33.3	30.2	91	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	29.2	88	63-125	
Fluoranthene	ug/kg	33.3	30.8	92	75-125	
Fluorene	ug/kg	33.3	25.0	75	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	29.5	89	63-125	
Naphthalene	ug/kg	33.3	25.2	76	49-125	
Phenanthrene	ug/kg	33.3	27.6	83	65-125	
Pyrene	ug/kg	33.3	26.9	81	64-125	
2-Fluorobiphenyl (S)	%			73	42-125	
p-Terphenyl-d14 (S)	%			90	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2898119		2898120		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Acenaphthene	ug/kg	1290	41.7	41.7	1130J	1340	-396	100	30-125		30	M6	
Acenaphthylene	ug/kg	ND	41.7	41.7	621J	736J	1490	1760	30-133		30	M6	
Anthracene	ug/kg	ND	41.7	41.7	2010	2620	4810	6270	30-150	26	30	M6	
Benzo(a)anthracene	ug/kg	ND	41.7	41.7	741J	999J	1780	2390	30-150		30	M6	
Benzo(a)pyrene	ug/kg	ND	41.7	41.7	197J	231J	473	554	30-150		30	M6	
Benzo(b)fluoranthene	ug/kg	ND	41.7	41.7	209J	223J	500	533	30-150		30	M6	
Benzo(g,h,i)perylene	ug/kg	ND	41.7	41.7	153J	146J	367	351	30-150		30	M6	
Benzo(k)fluoranthene	ug/kg	ND	41.7	41.7	ND	ND	0	0	30-150		30	M6	
Chrysene	ug/kg	ND	41.7	41.7	924J	1220J	2220	2920	30-150		30	M6	
Dibenz(a,h)anthracene	ug/kg	ND	41.7	41.7	80.7J	71.7J	193	172	30-131		30	M6	
Fluoranthene	ug/kg	ND	41.7	41.7	497J	579J	1190	1390	30-150		30	M6	
Fluorene	ug/kg	3310	41.7	41.7	2870	3300	-1060	-31	30-147	14	30	M6	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	41.7	41.7	ND	ND	176	196	30-150		30	M6	
Naphthalene	ug/kg	17700	41.7	41.7	13000	15300	-11400	-5700	30-131	17	30	M6	
Phenanthrene	ug/kg	10400	41.7	41.7	8630	10300	-4160	-164	30-150	18	30	M6	
Pyrene	ug/kg	ND	41.7	41.7	829J	1030J	1990	2460	30-150		30	M6	
2-Fluorobiphenyl (S)	%.						0	0	42-125			D3,P3, S4	
p-Terphenyl-d14 (S)	%.						0	0	57-125			S4	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 533802 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004

METHOD BLANK: 2899450 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/24/18 12:50	
Acenaphthylene	ug/kg	ND	10.0	04/24/18 12:50	
Anthracene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(a)anthracene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(a)pyrene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/24/18 12:50	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/24/18 12:50	
Chrysene	ug/kg	ND	10.0	04/24/18 12:50	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/24/18 12:50	
Fluoranthene	ug/kg	ND	10.0	04/24/18 12:50	
Fluorene	ug/kg	ND	10.0	04/24/18 12:50	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/24/18 12:50	
Naphthalene	ug/kg	ND	10.0	04/24/18 12:50	
Phenanthrene	ug/kg	ND	10.0	04/24/18 12:50	
Pyrene	ug/kg	ND	10.0	04/24/18 12:50	
2-Fluorobiphenyl (S)	%	58	42-125	04/24/18 12:50	
p-Terphenyl-d14 (S)	%	100	57-125	04/24/18 12:50	

LABORATORY CONTROL SAMPLE: 2899451

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	25.2	76	52-125	
Acenaphthylene	ug/kg	33.3	24.3	73	50-125	
Anthracene	ug/kg	33.3	28.8	86	65-125	
Benzo(a)anthracene	ug/kg	33.3	27.8	84	60-125	
Benzo(a)pyrene	ug/kg	33.3	29.2	87	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	26.5	79	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	28.3	85	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	30.2	91	67-125	
Chrysene	ug/kg	33.3	31.0	93	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	28.2	85	63-125	
Fluoranthene	ug/kg	33.3	28.3	85	75-125	
Fluorene	ug/kg	33.3	25.9	78	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	28.4	85	63-125	
Naphthalene	ug/kg	33.3	24.4	73	49-125	
Phenanthrene	ug/kg	33.3	26.2	79	65-125	
Pyrene	ug/kg	33.3	29.3	88	64-125	
2-Fluorobiphenyl (S)	%			79	42-125	
p-Terphenyl-d14 (S)	%			101	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Parameter	Units	2899452		2899453		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Acenaphthene	ug/kg	16.1	41.3	41.3	54.1	54.1	92	92	30-125	0	30		
Acenaphthylene	ug/kg	ND	41.3	41.3	40.9	34.6	99	84	30-133	17	30		
Anthracene	ug/kg	23.9	41.3	41.3	75.1	68.9	124	109	30-150	9	30		
Benzo(a)anthracene	ug/kg	58.8	41.3	41.3	126	105	163	111	30-150	19	30	M1	
Benzo(a)pyrene	ug/kg	74.7	41.3	41.3	151	124	184	121	30-150	19	30	M1	
Benzo(b)fluoranthene	ug/kg	91.9	41.3	41.3	175	148	200	136	30-150	16	30	M1	
Benzo(g,h,i)perylene	ug/kg	53.2	41.3	41.3	118	94.3	157	99	30-150	23	30	M1	
Benzo(k)fluoranthene	ug/kg	31.6	41.3	41.3	87.5	75.3	135	106	30-150	15	30		
Chrysene	ug/kg	84.4	41.3	41.3	161	132	186	116	30-150	20	30	M1	
Dibenz(a,h)anthracene	ug/kg	ND	41.3	41.3	49.2	42.3	119	102	30-131	15	30		
Fluoranthene	ug/kg	124	41.3	41.3	248	191	301	164	30-150	26	30	M1	
Fluorene	ug/kg	13.0	41.3	41.3	52.2	49.2	95	88	30-147	6	30		
Indeno(1,2,3-cd)pyrene	ug/kg	40.6	41.3	41.3	98.2	82.4	139	101	30-150	17	30		
Naphthalene	ug/kg	19.3	41.3	41.3	43.3	50.1	58	75	30-131	14	30		
Phenanthrene	ug/kg	94.8	41.3	41.3	197	162	247	163	30-150	19	30	M1	
Pyrene	ug/kg	141	41.3	41.3	258	192	284	124	30-150	29	30	M1	
2-Fluorobiphenyl (S)	%.						75	73	42-125				
p-Terphenyl-d14 (S)	%.						94	93	57-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 533572 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2898368 Matrix: Solid

Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/22/18 12:39	
n-Triacontane (S)	%.	115	50-150	04/22/18 12:39	

LABORATORY CONTROL SAMPLE & LCSD: 2898369

2898370

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	86.0	86.0	107	107	70-120	0	20	
n-Triacontane (S)	%.				115	119	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 439502 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 2030883 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	05/01/18 10:56	

LABORATORY CONTROL SAMPLE: 2030884

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	994	907	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030886 2030887

Parameter	Units	60268827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	1240	1220	1210	1170	98	95	75-125	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030888 2030889

Parameter	Units	60268827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	49.7	49.1	40.0	37.2	81	76	75-125	7	20	

SAMPLE DUPLICATE: 2030885

Parameter	Units	50195327001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 286937 Analysis Method: EPA 9012
QC Batch Method: EPA 9012A Analysis Description: 9012 Cyanide
Associated Lab Samples: 10428096001, 10428096002, 10428096003

METHOD BLANK: 1678360 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/25/18 13:16	

LABORATORY CONTROL SAMPLE: 1678361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678362 1678363

Parameter	Units	10427642001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Cyanide	mg/kg	0.52	3.72	3.72	4.0	4.1	93	97	80-120	4	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678364 1678365

Parameter	Units	10428096003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Cyanide	mg/kg	0.61	3.65	3.52	4.7	3.6	112	87	80-120	25	20	M0,R1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

QC Batch: 287059

Analysis Method: EPA 9012

QC Batch Method: EPA 9012A

Analysis Description: 9012 Cyanide

Associated Lab Samples: 10428096004, 10428096005

METHOD BLANK: 1679101

Matrix: Solid

Associated Lab Samples: 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/26/18 14:20	

LABORATORY CONTROL SAMPLE: 1679102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1679103 1679104

Parameter	Units	10428176001 Result	MS		MSD		% Rec		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec					
Cyanide	mg/kg	ND	10.3	8.3	10.3	10.9	71	95	80-120	27	20	M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

QC Batch: 141540 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

METHOD BLANK: 559769 Matrix: Solid
Associated Lab Samples: 10428096001, 10428096002, 10428096003, 10428096004, 10428096005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/30/18 17:39	

LABORATORY CONTROL SAMPLE: 559768

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	51.9	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559770 559771

Parameter	Units	10428096003 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	Max		Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result					RPD	RPD	
Fluoride	mg/kg	ND	50	11.4	49.3	12.3	23	25	80-120	7	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559772 559773

Parameter	Units	10428159006 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	Max		Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result					RPD	RPD	
Fluoride	mg/kg	0.97 U	49.7	35.9	48.9	41.7	72	85	80-120	15	20	M1	

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QUALIFIERS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M Analyte was not added to the MS due to spiking error.

2M Sample was brown in color.

3M Sample was yellow in color.

4M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

C0 Result confirmed by second analysis.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

ANALYTE QUALIFIERS

- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428096001	FL-TT-03(2-10) WM	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096002	FL-TT-06 (0-10) S	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096003	FL-TT-04 (2-14) WM	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096004	FL-TT-05 (5-15) WM	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096005	FL-TT-07 (1-5) S	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428096001	FL-TT-03(2-10) WM	EPA 3550	533571	EPA 8081B	534053
10428096002	FL-TT-06 (0-10) S	EPA 3550	533571	EPA 8081B	534053
10428096003	FL-TT-04 (2-14) WM	EPA 3550	533571	EPA 8081B	534053
10428096004	FL-TT-05 (5-15) WM	EPA 3550	533571	EPA 8081B	534053
10428096005	FL-TT-07 (1-5) S	EPA 3550	533571	EPA 8081B	534053
10428096001	FL-TT-03(2-10) WM	EPA 3550	533570	EPA 8082A	533946
10428096002	FL-TT-06 (0-10) S	EPA 3550	533570	EPA 8082A	533946
10428096003	FL-TT-04 (2-14) WM	EPA 3550	533570	EPA 8082A	533946
10428096004	FL-TT-05 (5-15) WM	EPA 3550	533570	EPA 8082A	533946
10428096005	FL-TT-07 (1-5) S	EPA 3550	533570	EPA 8082A	533946
10428096001	FL-TT-03(2-10) WM	WI MOD DRO	533572	WI MOD DRO	533638
10428096002	FL-TT-06 (0-10) S	WI MOD DRO	533572	WI MOD DRO	533638
10428096003	FL-TT-04 (2-14) WM	WI MOD DRO	533572	WI MOD DRO	533638
10428096004	FL-TT-05 (5-15) WM	WI MOD DRO	533572	WI MOD DRO	533638
10428096005	FL-TT-07 (1-5) S	WI MOD DRO	533572	WI MOD DRO	533638
10428096001	FL-TT-03(2-10) WM	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096002	FL-TT-06 (0-10) S	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096003	FL-TT-04 (2-14) WM	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096004	FL-TT-05 (5-15) WM	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096005	FL-TT-07 (1-5) S	EPA 5030 Medium Soil	535145	WI MOD GRO	535423
10428096001	FL-TT-03(2-10) WM	EPA 3050	533686	EPA 6010C	534230
10428096002	FL-TT-06 (0-10) S	EPA 3050	533686	EPA 6010C	534230
10428096003	FL-TT-04 (2-14) WM	EPA 3050	533686	EPA 6010C	534230
10428096004	FL-TT-05 (5-15) WM	EPA 3050	533686	EPA 6010C	534230
10428096005	FL-TT-07 (1-5) S	EPA 3050	533686	EPA 6010C	534230
10428096001	FL-TT-03(2-10) WM	EPA 3050B	438855	EPA 6020	439080
10428096002	FL-TT-06 (0-10) S	EPA 3050B	438855	EPA 6020	439080
10428096003	FL-TT-04 (2-14) WM	EPA 3050B	438855	EPA 6020	439080
10428096004	FL-TT-05 (5-15) WM	EPA 3050B	438855	EPA 6020	439080
10428096005	FL-TT-07 (1-5) S	EPA 3050B	438855	EPA 6020	439080
10428096001	FL-TT-03(2-10) WM	EPA 3050	533687	EPA 6020A	533858
10428096002	FL-TT-06 (0-10) S	EPA 3050	533687	EPA 6020A	533858
10428096003	FL-TT-04 (2-14) WM	EPA 3050	533687	EPA 6020A	533858
10428096004	FL-TT-05 (5-15) WM	EPA 3050	533687	EPA 6020A	533858
10428096005	FL-TT-07 (1-5) S	EPA 3050	533687	EPA 6020A	533858
10428096001	FL-TT-03(2-10) WM	EPA 7471	533683	EPA 7471	533810
10428096002	FL-TT-06 (0-10) S	EPA 7471	533683	EPA 7471	533810
10428096003	FL-TT-04 (2-14) WM	EPA 7471	533683	EPA 7471	533810
10428096004	FL-TT-05 (5-15) WM	EPA 7471	533683	EPA 7471	533810
10428096005	FL-TT-07 (1-5) S	EPA 7471	533683	EPA 7471	533810

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-FreewayLF Solids

Pace Project No.: 10428096

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428096001	FL-TT-03(2-10) WM	ASTM D2974	534083		
10428096002	FL-TT-06 (0-10) S	ASTM D2974	534083		
10428096003	FL-TT-04 (2-14) WM	ASTM D2974	535059		
10428096004	FL-TT-05 (5-15) WM	ASTM D2974	535059		
10428096005	FL-TT-07 (1-5) S	ASTM D2974	535059		
10428096001	FL-TT-03(2-10) WM	EPA 3550	533569	EPA 8270D	533831
10428096002	FL-TT-06 (0-10) S	EPA 3550	533569	EPA 8270D	533831
10428096003	FL-TT-04 (2-14) WM	EPA 3550	533569	EPA 8270D	533831
10428096004	FL-TT-05 (5-15) WM	EPA 3550	533569	EPA 8270D	533831
10428096005	FL-TT-07 (1-5) S	EPA 3550	533569	EPA 8270D	533831
10428096001	FL-TT-03(2-10) WM	EPA 3550	533802	EPA 8270D by SIM	534011
10428096002	FL-TT-06 (0-10) S	EPA 3550	533802	EPA 8270D by SIM	534011
10428096003	FL-TT-04 (2-14) WM	EPA 3550	533802	EPA 8270D by SIM	534011
10428096004	FL-TT-05 (5-15) WM	EPA 3550	533802	EPA 8270D by SIM	534011
10428096005	FL-TT-07 (1-5) S	EPA 3550	533524	EPA 8270D by SIM	534010
10428096001	FL-TT-03(2-10) WM	EPA 5035/5030B	535427	EPA 8260B	535620
10428096002	FL-TT-06 (0-10) S	EPA 5035/5030B	535427	EPA 8260B	535620
10428096003	FL-TT-04 (2-14) WM	EPA 5035/5030B	535427	EPA 8260B	535620
10428096004	FL-TT-05 (5-15) WM	EPA 5035/5030B	535427	EPA 8260B	535620
10428096005	FL-TT-07 (1-5) S	EPA 5035/5030B	535427	EPA 8260B	535620
10428096001	FL-TT-03(2-10) WM	EPA 3060A	439502	EPA 7196A	439771
10428096002	FL-TT-06 (0-10) S	EPA 3060A	439502	EPA 7196A	439771
10428096003	FL-TT-04 (2-14) WM	EPA 3060A	439502	EPA 7196A	439771
10428096004	FL-TT-05 (5-15) WM	EPA 3060A	439502	EPA 7196A	439771
10428096005	FL-TT-07 (1-5) S	EPA 3060A	439502	EPA 7196A	439771
10428096001	FL-TT-03(2-10) WM	Trivalent Chromium Calculation	440378		
10428096002	FL-TT-06 (0-10) S	Trivalent Chromium Calculation	440378		
10428096003	FL-TT-04 (2-14) WM	Trivalent Chromium Calculation	440378		
10428096004	FL-TT-05 (5-15) WM	Trivalent Chromium Calculation	440378		
10428096005	FL-TT-07 (1-5) S	Trivalent Chromium Calculation	440378		
10428096001	FL-TT-03(2-10) WM	EPA 9012A	286937	EPA 9012	286958
10428096002	FL-TT-06 (0-10) S	EPA 9012A	286937	EPA 9012	286958
10428096003	FL-TT-04 (2-14) WM	EPA 9012A	286937	EPA 9012	286958
10428096004	FL-TT-05 (5-15) WM	EPA 9012A	287059	EPA 9012	287085
10428096005	FL-TT-07 (1-5) S	EPA 9012A	287059	EPA 9012	287085
10428096001	FL-TT-03(2-10) WM	EPA 300.0	141540	EPA 9056A	141561
10428096002	FL-TT-06 (0-10) S	EPA 300.0	141540	EPA 9056A	141561
10428096003	FL-TT-04 (2-14) WM	EPA 300.0	141540	EPA 9056A	141561
10428096004	FL-TT-05 (5-15) WM	EPA 300.0	141540	EPA 9056A	141561
10428096005	FL-TT-07 (1-5) S	EPA 300.0	141540	EPA 9056A	141561

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-FreewayLF Solids
Pace Project No.: 10428096

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
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WO#: 10428096



10428096

Minnesota Pollution Control Agency		Work Order Number:		COC Type:		Page: 1 of 1													
PROJECT/CLIENT INFO		Turnaround Time:		COC ID:		FOR LAB USE ONLY													
LABORATORY		Lab Name:		Address:		Lab Work Order Sticker													
Facility Code: MNSW057/mPCA Freeway LF Solids		Project Name: MPCA - Freeway LF Solids		Project Task Code:		18-00383 EPIC Profile #38716													
Project Manager:		Potential Hazard?: If yes, add information to Sampler Comments Section		Phone No:															
SAMPLE DETAILS				ANALYSIS REQUESTED															
SAMPLE TYPE CODES Sample Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		FIELD MATRIX CODES Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		ANALYSIS See Attach for solids/waste. The Id Dioxin													
Location Identifier	Sample Type	Date	Time	Start Depth, ft	End Depth, ft	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#					
FL-TT-03 (2-10)WM	S	4/19/18	0900	2	10	C	SD				13	X	001	1					
FL-TT-06 (0-10)S	S	4/19/18	1145	0	10	C	SD				13	X	002	2					
FL-TT-04 (2-14)WM	S	4/19/18	1230	2	14	C	SD				13	X	003	3					
FL-TT-05 (5-15)WM	S	4/19/18	1500	5	15	C	SD				13	X	004	4					
FL-TT-07 (1-5)S	S	4/19/18	1715	1	5	C	SD				13	X	005	5					
Be J																			
04/20/18																			
Sampled By: Brad Jacobson/SJK/TJB										Sampler's Signature: <i>Brad Jacobson</i>		Phone #: 612-590-8276							
Receiving Comments:																			
Relinquished By/Affiliation					Date/Time					Accepted By/Affiliation					Date/Time				
<i>AJK</i>					4-20-18 0830					AK ACE					4-20-18 830				

3.6°C

Sample Condition Upon Receipt

Client Name: Minnesota Pollution Control Agency
Project #: _____

WO#: 10428096

PM: JMA Due Date: 05/04/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pade SpeeDee Other: _____
 Tracking Number: 44 4-20-18

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: True Date and Initials of Person Examining Contents: Hf 4-20-18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/20/2018

Note: Whenever there is a discrepancy among North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI GRO
DRO	WI DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

WO#: 12107524



12107524

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428096 Workorder Name: 18-00383 MPCA-FreewayLF Solids Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To					Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																				
							Preserved Containers					Total Fluoride by 9056					LAB USE ONLY					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																
1	FL-TT-03(2-10) WM	PS	4/19/2018 09:00	10428096001	Solid	1																X
2	FL-TT-06 (0-10) S	PS	4/19/2018 11:45	10428096002	Solid	1																X
3	FL-TT-04 (2-14) WM	PS	4/19/2018 12:30	10428096003	Solid	1																X
4	FL-TT-05 (5-15) WM	PS	4/19/2018 15:00	10428096004	Solid	1																X
5	FL-TT-07 (1-5) S	PS	4/19/2018 17:15	10428096005	Solid	1																X
												Comments										
Transfers	Released By	Date/Time	Received By	Date/Time																		
1	<i>[Signature]</i>	4/23/18 1800	D. Chapp	4-24-18 1900																		
2	<i>[Signature]</i>	4-24-18 2315	B. Mathews	4/25/18 0730																		
3																						
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																
2.4 °C		Y or N		Y or N		Y or N																

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN

Project #: **WO# : 12107524**
 PM: HRZ Due Date: 05/04/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.4 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 4/24/18 DC

Comments: Bm 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: [Signature] Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO#: 12107524



12107524

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428096 Workorder Name: 18-00383 MPCA-FreewayLF Solids Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To				Requested Analysis													
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Duluth 4730 Oneota St. Duluth, MN 55807 Phone (218)727-6380				Methyl Mercury by 1630													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix		Preserved Containers								LAB USE ONLY				
							Unpreserved												
1	FL-TT-03(2-10) WM	PS	4/19/2018 09:00	10428096001	Solid		1												
2	FL-TT-06 (0-10) S	PS	4/19/2018 11:45	10428096002	Solid		1												
3	FL-TT-04 (2-14) WM	PS	4/19/2018 12:30	10428096003	Solid		1												
4	FL-TT-05 (5-15) WM	PS	4/19/2018 15:00	10428096004	Solid	1													
5	FL-TT-07 (1-5) S	PS	4/19/2018 17:15	10428096005	Solid	1													

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	Kay [Signature]	4/23/18 1510	[Signature]	4-24-18 1900	
2	[Signature]	4-24-18 2315	[Signature]	4/25/18 0730	
3					

Cooler Temperature on Receipt 0.6 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace MN

Project #:

WO#: 12107524
 PM: HRZ Due Date: 05/04/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.5 Cooler Temp Corrected °C: 0.8 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 50.3 Date and Initials of Person Examining Contents: 4-24-18 DL

Comments: BM 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Client Name: Pace MN Sample Preservation Receipt Form
 Project # 40167891

All containers needing preservation have been checked and noted below: Yes No N/A


Initial when completed: _____ Date/Time: _____

Lab Lot# of pH paper: _____ Lab Std #ID of preservation (if pH adjusted): _____

Pace Lab #	Glass							Plastic							Vials					Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)					
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC								GN				
001																																					2.5 / 5 / 10
002																																					2.5 / 5 / 10
003																																					2.5 / 5 / 10
004																																					2.5 / 5 / 10
005																																					2.5 / 5 / 10
006																																					2.5 / 5 / 10
007																																					2.5 / 5 / 10
008																																					2.5 / 5 / 10
009																																					2.5 / 5 / 10
010																																					2.5 / 5 / 10
011																																					2.5 / 5 / 10
012																																					2.5 / 5 / 10
013																																					2.5 / 5 / 10
014																																					2.5 / 5 / 10
015																																					2.5 / 5 / 10
016																																					2.5 / 5 / 10
017																																					2.5 / 5 / 10
018																																					2.5 / 5 / 10
019																																					2.5 / 5 / 10
020																																					2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : Yes No N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 31Jan2018
	Document No.: F-GB-C-031-rev.06	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN

Project #: **WO# : 40167891**



Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

Tracking #: 1699968

Custody Seal on Cooler/Box Present: yes no **Seals intact:** yes no

Custody Seal on Samples Present: yes no **Seals intact:** yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 4 **Type of Ice:** Wet Blue Dry None Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 35 / Corr: 3

Temp Blank Present: yes no **Biological Tissue is Frozen:** yes no

Person examining contents:
 Date: 4-24-18
 Initials: SW

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis	Matrix: <u>S</u>	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: CA **Date:** 4/24/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428096 Workorder Name: 18-00383 MPCA-FreewayLF Solids Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To					Requested Analysis																															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100																																				
							5019S167																															
							LAB USE ONLY																															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Cr III	Cr VI	Total Cr by 6020																									
						Unpreserved																																
1	FL-TT-03(2-10) WM	PS	4/19/2018 09:00	10428098001	Solid	1						X	X	X																								
2	FL-TT-06 (0-10) S	PS	4/19/2018 11:45	10428098002	Solid	1						X	X	X																								
3	FL-TT-04 (2-14) WM	PS	4/19/2018 12:30	10428098003	Solid	1						X	X	X																								
4	FL-TT-05 (5-15) WM	PS	4/19/2018 15:00	10428098004	Solid	1						X	X	X																								
5	FL-TT-07 (1-5) S	PS	4/19/2018 17:15	10428098005	Solid	1						X	X	X																								
Transfers		Released By	Date/Time	Received By		Date/Time		Comments																														
1		<i>Ray Ford</i>	4/23/18	<i>KID</i>		4/23/18																																
2		<i>felex</i>	4-24-18	<i>Jason Hoff</i>		4-24-18																																
3																																						
Cooler Temperature on Receipt		3.0 °C	Custody Seal		<input checked="" type="checkbox"/> or N	Received on Ice		<input checked="" type="checkbox"/> or N	Samples Intact							<input checked="" type="checkbox"/> or N																						

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50195167

Date/Time and Initials of person examining contents: JH 4-24-18 1232

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2993

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 3.9/3.9 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			<input checked="" type="checkbox"/>
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)?: Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC?: Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

May 04, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/24/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kari-Ann Killian For Jessica Esser
Project Manager

Certification List		Expires	
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428096
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-TT-03(2-10) WM (10428096001)	A181702-01	Solid	04/19/2018	04/24/2018
FL-TT-06 (0-10) S (10428096002)	A181702-02	Solid	04/19/2018	04/24/2018
FL-TT-04 (2-14) WM (10428096003)	A181702-03	Solid	04/19/2018	04/24/2018
FL-TT-05 (5-15) WM (10428096004)	A181702-04	Solid	04/19/2018	04/24/2018
FL-TT-07 (1-5) S (10428096005)	A181702-05	Solid	04/19/2018	04/24/2018

CASE NARRATIVE

Sample Receipt Information:

Five samples were received on April 24, 2018. Samples were received at 3.1 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

FL-TT-06 (0-10) S (10428096002)
A181702-02 (Solid)

Date Sampled
04/19/2018 11:45

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804197

2,4-D	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 16:26	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 16:26	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 21:36	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 16:26	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 21:36	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 16:26	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 16:26	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 16:26	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 16:26	EPA 8321B	
Surrogate: DCAA		96.9 %	70.8-116		04/26/2018	05/01/2018 16:26	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	74.6	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428096
Project Manager: Jennifer Anderson

FL-TT-04 (2-14) WM (10428096003)
A181702-03 (Solid)

Date Sampled
04/19/2018 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804197

2,4-D	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 03:05	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 03:05	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 03:05	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 22:01	EPA 8321B	
Surrogate: DCAA		87.1 %		70.8-116	04/26/2018	05/01/2018 22:01	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	59.5	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

FL-TT-05 (5-15) WM (10428096004)
A181702-04 (Solid)

Date Sampled
04/19/2018 15:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804197

2,4-D	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 04:11	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 04:11	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 04:11	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 04:11	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/26/2018	05/01/2018 23:08	EPA 8321B	
Surrogate: DCAA		81.8 %	70.8-116		04/26/2018	05/01/2018 23:08	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	67.6	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

FL-TT-07 (1-5) S (10428096005)
A181702-05 (Solid)

Date Sampled
04/19/2018 17:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804197

2,4-D	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 05:17	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 05:17	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 00:15	EPA 8321B	
Surrogate: DCAA		85.8 %		70.8-116	04/26/2018	05/02/2018 00:15	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	51.1	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

Blank (A804197-BLK1)		Prepared: 04/26/2018 Analyzed: 04/27/2018 01:46								
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
<i>Surrogate: DCAA</i>	21.3		mg/kg wet	20.00		107	70.8-116			
<i>Surrogate: DCAA [2C]</i>	20.2		mg/kg wet	20.00		101	62.3-114			

LCS (A804197-BS1)		Prepared: 04/26/2018 Analyzed: 04/26/2018 23:32								
2,4-D	1.91	0.10	mg/kg wet	2.000		95.3	81.6-107			
2,4-D [2C]	1.87	0.10	mg/kg wet	2.000		93.4	71.8-120			
2,4-DB	1.75	0.10	mg/kg wet	2.000		87.5	76.4-107			
2,4-DB [2C]	1.90	0.10	mg/kg wet	2.000		95.1	62.2-129			
2,4,5-T	1.94	0.10	mg/kg wet	2.000		97.1	81.2-110			
2,4,5-T [2C]	1.99	0.10	mg/kg wet	2.000		99.6	70.6-125			
2,4,5-TP	1.89	0.10	mg/kg wet	2.000		94.3	79.1-106			
2,4,5-TP [2C]	1.93	0.10	mg/kg wet	2.000		96.3	68.2-118			
Bentazon	1.03	0.10	mg/kg wet	1.000		103	82.5-119			
Bentazon [2C]	0.898	0.10	mg/kg wet	1.000		89.8	73.3-125			
Dicamba	2.00	0.10	mg/kg wet	2.000		99.9	85.1-108			
Dicamba [2C]	2.03	0.10	mg/kg wet	2.000		101	71.4-115			
Picloram	0.993	0.10	mg/kg wet	1.000		99.3	86.1-106			
Picloram [2C]	0.891	0.10	mg/kg wet	1.000		89.1	74.5-114			
Triclopyr	1.84	0.10	mg/kg wet	2.000		91.8	78.6-106			
Triclopyr [2C]	1.90	0.10	mg/kg wet	2.000		95.1	69.4-118			
<i>Surrogate: DCAA</i>	20.6		mg/kg wet	20.00		103	70.8-116			
<i>Surrogate: DCAA [2C]</i>	19.8		mg/kg wet	20.00		98.8	62.3-114			

LCS (A804197-BS2)		Prepared: 04/26/2018 Analyzed: 04/27/2018 00:39								
MCPA	2.14	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	2.26	0.10	mg/kg wet	2.000		113	77-123			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

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1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428096
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

LCS (A804197-BS2)

Prepared: 04/26/2018 Analyzed: 04/27/2018 00:39

Surrogate: DCAA	21.0		mg/kg wet	20.00		105	70.8-116			
Surrogate: DCAA [2C]	22.4		mg/kg wet	20.00		112	62.3-114			

Matrix Spike (A804197-MS1)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 17:33

2,4-D	2.39	0.10	mg/kg dry	2.682	ND	89.2	71.4-105			
2,4-D [2C]	2.16	0.10	mg/kg dry	2.682	0.0340	79.1	50.5-123			
2,4-DB	2.20	0.10	mg/kg dry	2.682	ND	82.2	46.4-117			
2,4-DB [2C]	2.12	0.10	mg/kg dry	2.682	0.0486	77.3	44.5-121			
2,4,5-T	2.46	0.10	mg/kg dry	2.682	0.0528	89.8	66.2-110			
2,4,5-T [2C]	2.28	0.10	mg/kg dry	2.682	ND	85.0	43.6-126			
2,4,5-TP	2.37	0.10	mg/kg dry	2.682	ND	88.5	52.4-114			
2,4,5-TP [2C]	2.21	0.10	mg/kg dry	2.682	0.0443	80.7	47.6-117			
Bentazon	1.25	0.10	mg/kg dry	1.341	0.0694	88.0	61.5-117			
Bentazon [2C]	0.896	0.10	mg/kg dry	1.341	0.0365	64.1	50.7-127			
Dicamba	2.06	0.10	mg/kg dry	2.682	ND	76.6	48.4-111			
Dicamba [2C]	1.95	0.10	mg/kg dry	2.682	0.0300	71.6	43.3-108			
Picloram	0.852	0.10	mg/kg dry	1.341	ND	63.5	26.7-110			
Picloram [2C]	0.565	0.10	mg/kg dry	1.341	0.00941	41.4	10.8-110			
Triclopyr	2.34	0.10	mg/kg dry	2.682	ND	87.2	56-113			
Triclopyr [2C]	2.29	0.10	mg/kg dry	2.682	0.0413	83.7	47.9-120			
Surrogate: DCAA	25.5		mg/kg dry	26.82		95.0	70.8-116			
Surrogate: DCAA [2C]	21.9		mg/kg dry	26.82		81.8	62.3-114			

Matrix Spike (A804197-MS2)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 19:47

MCPA	2.69	0.10	mg/kg dry	2.682	ND	100	74.2-114			
MCPA [2C]	2.57	0.10	mg/kg dry	2.682	0.0400	94.5	60.9-122			
Surrogate: DCAA	26.5		mg/kg dry	26.82		98.8	70.8-116			
Surrogate: DCAA [2C]	26.3		mg/kg dry	26.82		98.2	62.3-114			

Matrix Spike Dup (A804197-MSD1)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 18:40

2,4-D	2.40	0.10	mg/kg dry	2.682	ND	89.3	71.4-105	0.174	20	
2,4-D [2C]	2.16	0.10	mg/kg dry	2.682	0.0340	79.1	50.5-123	0.0217	20	
2,4-DB	2.19	0.10	mg/kg dry	2.682	ND	81.5	46.4-117	0.805	20	
2,4-DB [2C]	2.14	0.10	mg/kg dry	2.682	0.0486	78.0	44.5-121	0.882	20	
2,4,5-T	2.44	0.10	mg/kg dry	2.682	0.0528	89.0	66.2-110	0.921	20	
2,4,5-T [2C]	2.28	0.10	mg/kg dry	2.682	ND	85.1	43.6-126	0.192	20	
2,4,5-TP	2.40	0.10	mg/kg dry	2.682	ND	89.4	52.4-114	1.02	20	
2,4,5-TP [2C]	2.17	0.10	mg/kg dry	2.682	0.0443	79.3	47.6-117	1.71	20	
Bentazon	1.39	0.10	mg/kg dry	1.341	0.0694	98.4	61.5-117	10.6	20	
Bentazon [2C]	1.03	0.10	mg/kg dry	1.341	0.0365	74.2	50.7-127	14.1	20	
Dicamba	2.18	0.10	mg/kg dry	2.682	ND	81.4	48.4-111	6.02	20	
Dicamba [2C]	2.12	0.10	mg/kg dry	2.682	0.0300	77.9	43.3-108	8.30	20	
Picloram	0.927	0.10	mg/kg dry	1.341	ND	69.1	26.7-110	8.41	20	
Picloram [2C]	0.611	0.10	mg/kg dry	1.341	0.00941	44.9	10.8-110	7.94	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

Matrix Spike Dup (A804197-MSD1)		Source: A181702-02			Prepared: 04/26/2018 Analyzed: 05/01/2018 18:40					
Triclopyr	2.32	0.10	mg/kg dry	2.682	ND	86.3	56-113	1.05	20	
Triclopyr [2C]	2.16	0.10	mg/kg dry	2.682	0.0413	78.9	47.9-120	5.78	20	
Surrogate: DCAA	26.2		mg/kg dry	26.82		97.8	70.8-116			
Surrogate: DCAA [2C]	23.6		mg/kg dry	26.82		88.1	62.3-114			
Matrix Spike Dup (A804197-MSD2)		Source: A181702-02			Prepared: 04/26/2018 Analyzed: 05/01/2018 20:54					
MCPA	2.68	0.10	mg/kg dry	2.682	ND	99.8	74.2-114	0.430	20	
MCPA [2C]	2.53	0.10	mg/kg dry	2.682	0.0400	92.7	60.9-122	1.83	20	
Surrogate: DCAA	25.9		mg/kg dry	26.82		96.7	70.8-116			
Surrogate: DCAA [2C]	26.3		mg/kg dry	26.82		98.0	62.3-114			



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 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428096
 Project Manager: Jennifer Anderson

Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804195 - % Solids

Duplicate (A804195-DUP1)	Source: A181708-01	Prepared: 04/25/2018	Analyzed: 04/27/2018 09:07		
% Solids	79.2	0.00 % by Weight	79.6	0.516	20



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428096
Project Manager: Jennifer Anderson

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181702



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428096

Workorder Name: 18-00383 MPCA-FreewayLF Solids

Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To	Subcontract To	Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451	Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																
												MDA List II					
Preserved Containers																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved											LAB USE ONLY
1	FL-TT-03(2-10) WM	PS	4/19/2018 09:00	10428096001	Solid	1											01
2	FL-TT-06 (0-10) S	PS	4/19/2018 11:45	10428096002	Solid	1											02
3	FL-TT-04 (2-14) WM	PS	4/19/2018 12:30	10428096003	Solid	1											03
4	FL-TT-05 (5-15) WM	PS	4/19/2018 15:00	10428096004	Solid	1											04
5	FL-TT-07 (1-5) S	PS	4/19/2018 17:15	10428096005	Solid	1											05

Transfers					Comments											
Released By	Date/Time	Received By	Date/Time													
Miguel Pacer	4/23/18 16:30	Kari Ann Kelly	4/24/18													
			0924													

Cooler Temperature on Receipt 3.1 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 Exp. 7/12/18

May 09, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
California Certification #2973
Montana Certificate #CERT0103
California Certification #2973
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Duluth Minnesota Certification ID's

4730 Oneota St., Duluth, MN 55807
Minnesota Dept of Health Certification #: 1382680
Nevada DCNR Certification #: MN000372018-1

Montana DHHS Certification #: CERT0102
Wisconsin DNR Certification #: 999446800
North Dakota Certification #: R-105

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Green Bay Certification IDs

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10428176001	FL-TT-08 (1-7 WM)	Solid	04/20/18 14:30	04/20/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428176001	FL-TT-08 (1-7 WM)	EPA 1630 (1998)	CPK	1	PASI-DUL
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	12	PASI-M
		WI MOD DRO	EC2	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010C	DM	11	PASI-M
		EPA 6020	DMT	1	PASI-I
		EPA 6020A	TT3	10	PASI-M
		EPA 7471	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 8270D by SIM	STB	18	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 7196A	JRB	1	PASI-I
		Trivalent Chromium Calculation	AET1	1	PASI-I
		EPA 9012	DAW	1	PASI-G
		EPA 9056A	MCT	1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: **FL-TT-08 (1-7 WM)** Lab ID: **10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1630 Methyl Mercury Analytical Method: EPA 1630 (1998) Preparation Method: EPA 1630 (1998)								
Methyl Mercury	ND	ng/g	18.3	1	05/04/18 10:07	05/07/18 15:03	7439-97-6	N3
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA 3550								
Aldrin	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	309-00-2	
alpha-BHC	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	319-84-6	
beta-BHC	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	319-85-7	
delta-BHC	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	319-86-8	
gamma-BHC (Lindane)	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	58-89-9	
Chlordane (Technical)	ND	ug/kg	232	5	04/26/18 06:51	05/04/18 23:16	57-74-9	
alpha-Chlordane	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	5103-71-9	
gamma-Chlordane	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	5103-74-2	
4,4'-DDD	68.7	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	72-54-8	
4,4'-DDE	93.9	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	72-55-9	
4,4'-DDT	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	50-29-3	
Dieldrin	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	60-57-1	
Endosulfan I	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	959-98-8	
Endosulfan II	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	33213-65-9	
Endosulfan sulfate	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	1031-07-8	
Endrin	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	72-20-8	
Endrin aldehyde	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	7421-93-4	
Endrin ketone	ND	ug/kg	46.2	5	04/26/18 06:51	05/04/18 23:16	53494-70-5	
Heptachlor	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	76-44-8	
Heptachlor epoxide	ND	ug/kg	23.2	5	04/26/18 06:51	05/04/18 23:16	1024-57-3	
Methoxychlor	ND	ug/kg	232	5	04/26/18 06:51	05/04/18 23:16	72-43-5	
Toxaphene	ND	ug/kg	693	5	04/26/18 06:51	05/04/18 23:16	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	94	%	30-150	5	04/26/18 06:51	05/04/18 23:16	877-09-8	1M,D4
Decachlorobiphenyl (S)	97	%	30-150	5	04/26/18 06:51	05/04/18 23:16	2051-24-3	
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	11100-14-4	
PCB, Total	ND	ug/kg	91.3	1	04/23/18 13:09	04/24/18 12:01	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	67	%	48-125	1	04/23/18 13:09	04/24/18 12:01	877-09-8	
Decachlorobiphenyl (S)	74	%	30-134	1	04/23/18 13:09	04/24/18 12:01	2051-24-3	CH
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	781	mg/kg	211	10	04/23/18 18:25	04/25/18 13:58		T6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Project No.: 10428176

Sample: FL-TT-08 (1-7 WM) Lab ID: 10428176001 Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Surrogates								
n-Triacontane (S)	0	%	50-150	10	04/23/18 18:25	04/25/18 13:58	638-68-6	S4
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil								
Gasoline Range Organics	ND	mg/kg	29.9	1	05/03/18 14:43	05/04/18 08:24		
Surrogates								
a,a,a-Trifluorotoluene (S)	99	%	80-150	1	05/03/18 14:43	05/04/18 08:24	98-08-8	
6010C MET ICP Analytical Method: EPA 6010C Preparation Method: EPA 3050								
Aluminum	9180	mg/kg	27.0	1	04/23/18 07:48	04/26/18 14:13	7429-90-5	
Barium	383	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:13	7440-39-3	
Boron	47.3	mg/kg	20.2	1	04/23/18 07:48	04/26/18 14:13	7440-42-8	
Copper	30.6	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:13	7440-50-8	
Iron	22500	mg/kg	6.7	1	04/23/18 07:48	04/26/18 14:13	7439-89-6	
Manganese	470	mg/kg	0.67	1	04/23/18 07:48	04/26/18 14:13	7439-96-5	
Nickel	19.6	mg/kg	2.7	1	04/23/18 07:48	04/26/18 14:13	7440-02-0	
Silver	2.6	mg/kg	1.3	1	04/23/18 07:48	04/26/18 14:13	7440-22-4	
Tin	16.2	mg/kg	10.1	1	04/23/18 07:48	04/26/18 14:13	7440-31-5	
Titanium	163	mg/kg	3.4	1	04/23/18 07:48	04/26/18 14:13	7440-32-6	
Zinc	776	mg/kg	2.7	1	04/23/18 07:48	04/26/18 14:13	7440-66-6	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Chromium	14.4	mg/kg	0.54	1	04/25/18 09:25	04/26/18 04:38	7440-47-3	N2
6020A MET ICPMS Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Antimony	ND	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7440-36-0	
Arsenic	5.6	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7440-38-2	
Beryllium	0.73	mg/kg	0.56	20	04/23/18 08:19	04/25/18 16:16	7440-41-7	
Cadmium	2.0	mg/kg	0.22	20	04/23/18 08:19	04/25/18 16:16	7440-43-9	
Cobalt	11.4	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7440-48-4	
Lead	88.4	mg/kg	0.28	20	04/23/18 08:19	04/25/18 16:16	7439-92-1	
Lithium	7.8	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7439-93-2	
Selenium	1.9	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7782-49-2	
Strontium	81.7	mg/kg	1.4	20	04/23/18 08:19	04/25/18 16:16	7440-24-6	
Vanadium	34.2	mg/kg	2.8	20	04/23/18 08:19	04/25/18 16:16	7440-62-2	
7471 Mercury Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	0.12	mg/kg	0.052	1	04/23/18 07:02	04/24/18 16:41	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	64.0	%	0.10	1		05/02/18 12:05		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	83-32-9	
Acenaphthylene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	208-96-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: **FL-TT-08 (1-7 WM)** Lab ID: **10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Anthracene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	120-12-7	
Benzo(a)anthracene	1060	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	56-55-3	
Benzo(a)pyrene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	50-32-8	
Benzo(b)fluoranthene	1160	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	207-08-9	
4-Bromophenylphenyl ether	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	101-55-3	
Butylbenzylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	85-68-7	
Carbazole	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	86-74-8	
4-Chloro-3-methylphenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	59-50-7	
4-Chloroaniline	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	108-60-1	
2-Chloronaphthalene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	91-58-7	
2-Chlorophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	7005-72-3	
Chrysene	1090	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	53-70-3	
Dibenzofuran	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	120-83-2	
Diethylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	105-67-9	
Dimethylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	131-11-3	
Di-n-butylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	4720	1	04/24/18 16:53	04/26/18 18:36	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	606-20-2	
Di-n-octylphthalate	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	117-84-0	
1,2-Diphenylhydrazine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	122-66-7	
bis(2-Ethylhexyl)phthalate	8130	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	117-81-7	
Fluoranthene	2280	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	206-44-0	
Fluorene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	87-68-3	
Hexachlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	118-74-1	
Hexachloroethane	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	193-39-5	
Isophorone	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	78-59-1	
1-Methylnaphthalene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	90-12-0	
2-Methylnaphthalene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: **FL-TT-08 (1-7 WM)** Lab ID: **10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	1830	1	04/24/18 16:53	04/26/18 18:36		
Naphthalene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	91-20-3	
2-Nitroaniline	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	88-74-4	
3-Nitroaniline	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	99-09-2	
4-Nitroaniline	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	100-01-6	
Nitrobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	98-95-3	
2-Nitrophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	88-75-5	
4-Nitrophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	100-02-7	
N-Nitrosodimethylamine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	86-30-6	
Pentachlorophenol	ND	ug/kg	1860	1	04/24/18 16:53	04/26/18 18:36	87-86-5	
Phenanthrene	1700	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	85-01-8	
Phenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	108-95-2	
Pyrene	2050	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	916	1	04/24/18 16:53	04/26/18 18:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	62	%.	43-125	1	04/24/18 16:53	04/26/18 18:36	4165-60-0	
2-Fluorobiphenyl (S)	75	%.	30-132	1	04/24/18 16:53	04/26/18 18:36	321-60-8	
p-Terphenyl-d14 (S)	86	%.	62-125	1	04/24/18 16:53	04/26/18 18:36	1718-51-0	
Phenol-d6 (S)	65	%.	48-125	1	04/24/18 16:53	04/26/18 18:36	13127-88-3	
2-Fluorophenol (S)	63	%.	40-125	1	04/24/18 16:53	04/26/18 18:36	367-12-4	
2,4,6-Tribromophenol (S)	76	%.	60-125	1	04/24/18 16:53	04/26/18 18:36	118-79-6	
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	83-32-9	
Acenaphthylene	ND	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	208-96-8	
Anthracene	29.6	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	120-12-7	
Benzo(a)anthracene	66.4	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	56-55-3	
Benzo(a)pyrene	69.7	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	50-32-8	
Benzo(b)fluoranthene	98.3	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	205-99-2	
Benzo(g,h,i)perylene	58.5	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	191-24-2	
Benzo(k)fluoranthene	81.8	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	207-08-9	
Chrysene	98.1	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	53-70-3	
Fluoranthene	126	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	206-44-0	
Fluorene	90.8	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	86-73-7	
Indeno(1,2,3-cd)pyrene	46.6	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	193-39-5	
Naphthalene	30.8	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	91-20-3	
Phenanthrene	116	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	85-01-8	
Pyrene	96.0	ug/kg	27.7	1	04/23/18 07:27	04/24/18 20:33	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	80	%.	42-125	1	04/23/18 07:27	04/24/18 20:33	321-60-8	
p-Terphenyl-d14 (S)	62	%.	57-125	1	04/23/18 07:27	04/24/18 20:33	1718-51-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: **FL-TT-08 (1-7 WM)** Lab ID: **10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	2740	1	05/03/18 13:18	05/03/18 21:13	67-64-1	
Allyl chloride	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	107-05-1	
Benzene	ND	ug/kg	54.9	1	05/03/18 13:18	05/03/18 21:13	71-43-2	
Bromobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	108-86-1	
Bromochloromethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	74-97-5	
Bromodichloromethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	75-27-4	
Bromoform	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	75-25-2	
Bromomethane	ND	ug/kg	1370	1	05/03/18 13:18	05/03/18 21:13	74-83-9	
2-Butanone (MEK)	ND	ug/kg	686	1	05/03/18 13:18	05/03/18 21:13	78-93-3	
n-Butylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	104-51-8	
sec-Butylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	135-98-8	
tert-Butylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	98-06-6	
Carbon tetrachloride	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	56-23-5	
Chlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	108-90-7	
Chloroethane	ND	ug/kg	1370	1	05/03/18 13:18	05/03/18 21:13	75-00-3	
Chloroform	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	67-66-3	
Chloromethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	74-87-3	
2-Chlorotoluene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	95-49-8	
4-Chlorotoluene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	1370	1	05/03/18 13:18	05/03/18 21:13	96-12-8	
Dibromochloromethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	106-93-4	
Dibromomethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	541-73-1	
1,4-Dichlorobenzene	415	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	75-71-8	
1,1-Dichloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	75-34-3	
1,2-Dichloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	107-06-2	
1,1-Dichloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	156-60-5	
Dichlorofluoromethane	ND	ug/kg	1370	1	05/03/18 13:18	05/03/18 21:13	75-43-4	
1,2-Dichloropropane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	78-87-5	
1,3-Dichloropropane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	142-28-9	
2,2-Dichloropropane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	594-20-7	
1,1-Dichloropropene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	60-29-7	
Ethylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	686	1	05/03/18 13:18	05/03/18 21:13	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	98-82-8	
p-Isopropyltoluene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	99-87-6	
Methylene Chloride	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	686	1	05/03/18 13:18	05/03/18 21:13	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Sample: FL-TT-08 (1-7 WM) **Lab ID: 10428176001** Collected: 04/20/18 14:30 Received: 04/20/18 17:30 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Methyl-tert-butyl ether	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	1634-04-4	
Naphthalene	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	91-20-3	
n-Propylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	103-65-1	
Styrene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	79-34-5	
Tetrachloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	127-18-4	
Tetrahydrofuran	ND	ug/kg	5490	1	05/03/18 13:18	05/03/18 21:13	109-99-9	
Toluene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	79-00-5	
Trichloroethene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	79-01-6	
Trichlorofluoromethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	549	1	05/03/18 13:18	05/03/18 21:13	76-13-1	
1,2,4-Trimethylbenzene	156	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	137	1	05/03/18 13:18	05/03/18 21:13	108-67-8	
Vinyl chloride	ND	ug/kg	54.9	1	05/03/18 13:18	05/03/18 21:13	75-01-4	
Xylene (Total)	ND	ug/kg	412	1	05/03/18 13:18	05/03/18 21:13	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1	05/03/18 13:18	05/03/18 21:13	17060-07-0	
Toluene-d8 (S)	98	%.	75-125	1	05/03/18 13:18	05/03/18 21:13	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1	05/03/18 13:18	05/03/18 21:13	460-00-4	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	281	50	04/28/18 10:30	04/30/18 14:43	18540-29-9	D3
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	14.4	mg/kg	1.0	1		05/04/18 14:40	16065-83-1	
9012 Cyanide, Total		Analytical Method: EPA 9012 Preparation Method: EPA 9012A						
Cyanide	ND	mg/kg	1.4	1	04/26/18 10:15	04/26/18 14:29	57-12-5	M0,R1
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Fluoride	ND	mg/kg	1.0	1	04/27/18 12:45	04/30/18 20:15	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 142287 Analysis Method: EPA 1630 (1998)
QC Batch Method: EPA 1630 (1998) Analysis Description: 1630 Methyl Mercury
Associated Lab Samples: 10428176001

METHOD BLANK: 562608 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.21	05/07/18 13:37	N3

METHOD BLANK: 562609 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.15	05/07/18 13:43	N3

METHOD BLANK: 562610 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methyl Mercury	ng/g	ND	3.21	05/07/18 13:50	N3

LABORATORY CONTROL SAMPLE: 562611

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methyl Mercury	ng/g	100	113	112	67-133	N3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 562612 562613

Parameter	Units	10428096004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methyl Mercury	ng/g	ND	359	372	373	444	104	119	65-135	17	35	N3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 535880	Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil	Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10428176001	

METHOD BLANK: 2912515 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	05/03/18 23:08	
a,a,a-Trifluorotoluene (S)	%.	100	80-150	05/03/18 23:08	

LABORATORY CONTROL SAMPLE & LCSD: 2912516

Parameter	Units	2912517				% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
Gasoline Range Organics	mg/kg	50	43.4	45.7	87	91	80-120	5	20
a,a,a-Trifluorotoluene (S)	%.				98	97	80-150		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2912904 2912905

Parameter	Units	10429117007		2912905		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Gasoline Range Organics	mg/kg	ND	51.8	50.2	51.9	48.7	100	97	80-120	6	20
a,a,a-Trifluorotoluene (S)	%.						99	99	80-150		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 533683

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10428176001

METHOD BLANK: 2898961

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	04/24/18 15:54	

LABORATORY CONTROL SAMPLE: 2898962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.51	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898963 2898964

Parameter	Units	10428159001		2898963		2898964		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Mercury	mg/kg	0.097	.52	.51	0.65	0.62	105	103	80-120	5	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 533686

Analysis Method: EPA 6010C

QC Batch Method: EPA 3050

Analysis Description: 6010C Solids

Associated Lab Samples: 10428176001

METHOD BLANK: 2898973

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.3	04/26/18 13:37	
Barium	mg/kg	ND	0.47	04/26/18 13:37	
Boron	mg/kg	ND	7.0	04/26/18 13:37	
Copper	mg/kg	ND	0.47	04/26/18 13:37	
Iron	mg/kg	ND	2.3	04/26/18 13:37	
Manganese	mg/kg	ND	0.23	04/26/18 13:37	
Nickel	mg/kg	ND	0.93	04/26/18 13:37	
Silver	mg/kg	ND	0.47	04/26/18 13:37	
Tin	mg/kg	ND	3.5	04/26/18 13:37	
Titanium	mg/kg	ND	1.2	04/26/18 13:37	
Zinc	mg/kg	ND	0.93	04/26/18 13:37	

LABORATORY CONTROL SAMPLE: 2898974

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	971	965	99	80-120	
Barium	mg/kg	48.5	50.1	103	80-120	
Boron	mg/kg	48.5	44.5	92	80-120	
Copper	mg/kg	48.5	48.4	100	80-120	
Iron	mg/kg	971	983	101	80-120	
Manganese	mg/kg	48.5	49.9	103	80-120	
Nickel	mg/kg	48.5	48.5	100	80-120	
Silver	mg/kg	24.3	22.8	94	80-120	
Tin	mg/kg	48.5	48.8	100	80-120	
Titanium	mg/kg	48.5	49.1	101	80-120	
Zinc	mg/kg	48.5	47.4	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898975 2898976

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428096001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum	mg/kg	24900	3380	3480	19400	40300	-165	441	75-125	70	20 P6,R1
Barium	mg/kg	428	169	174	408	498	-12	40	75-125	20	20 M1
Boron	mg/kg	109	169	174	229	285	71	101	75-125	22	20 M1,R1
Copper	mg/kg	448	169	174	446	1230	-1	452	75-125	94	20 M1,R1
Iron	mg/kg	166000	3380	3480	226000	163000	1800	-74	75-125	32	20 M6,R1
Manganese	mg/kg	596	169	174	887	870	172	158	75-125	2	20 M1
Nickel	mg/kg	62.5	169	174	223	235	95	99	75-125	5	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Parameter	Units	2898975		2898976		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10428096001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Silver	mg/kg	26.3	84.5	86.9	95.0	99.1	81	84	75-125	4	20		
Tin	mg/kg	406	169	174	601	743	116	194	75-125	21	20	M1, R1	
Titanium	mg/kg	208	169	174	430	468	131	149	75-125	9	20	M1	
Zinc	mg/kg	831	169	174	901	1010	42	105	75-125	12	20	P6	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 438855

Analysis Method: EPA 6020

QC Batch Method: EPA 3050B

Analysis Description: 6020 MET

Associated Lab Samples: 10428176001

METHOD BLANK: 2027873

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.19	04/26/18 02:38	N2

LABORATORY CONTROL SAMPLE: 2027874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	3.7	3.9	106	80-120	N2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027875 2027876

Parameter	Units	2027875		2027876		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium	mg/kg	5.4	4.87	4.87	7.0	6.1	34	15	75-125	14	20 M0, N2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 533687 Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10428176001

METHOD BLANK: 2898977 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.49	04/24/18 18:20	
Arsenic	mg/kg	ND	0.49	04/24/18 18:20	
Beryllium	mg/kg	ND	0.19	04/24/18 18:20	
Cadmium	mg/kg	ND	0.078	04/24/18 18:20	
Cobalt	mg/kg	ND	0.49	04/24/18 18:20	
Lead	mg/kg	ND	0.097	04/24/18 18:20	
Lithium	mg/kg	ND	0.49	04/24/18 18:20	
Selenium	mg/kg	ND	0.49	04/24/18 18:20	
Strontium	mg/kg	ND	0.49	04/24/18 18:20	
Vanadium	mg/kg	ND	0.97	04/24/18 18:20	

LABORATORY CONTROL SAMPLE: 2898978

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	47.6	47.2	99	80-120	
Arsenic	mg/kg	47.6	46.8	98	80-120	
Beryllium	mg/kg	47.6	49.9	105	80-120	
Cadmium	mg/kg	47.6	47.0	99	80-120	
Cobalt	mg/kg	47.6	48.1	101	80-120	
Lead	mg/kg	47.6	49.6	104	80-120	
Lithium	mg/kg	47.6	52.3	110	80-120	
Selenium	mg/kg	47.6	48.6	102	80-120	
Strontium	mg/kg	47.6	48.0	101	80-120	
Vanadium	mg/kg	47.6	47.3	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898979 2898980

Parameter	Units	10428096001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Antimony	mg/kg	3.7	167	170	162	153	95	88	75-125	6	20		
Arsenic	mg/kg	11.9	167	170	200	181	113	99	75-125	10	20		
Beryllium	mg/kg	ND	167	170	195	181	116	106	75-125	8	20		
Cadmium	mg/kg	38.6	167	170	182	178	86	82	75-125	2	20		
Cobalt	mg/kg	8.4	167	170	214	187	123	105	75-125	13	20		
Lead	mg/kg	691	167	170	41400	4040	24300	1970	75-125	164	20	E, M6, R1	
Lithium	mg/kg	2.4	167	170	205	191	121	111	75-125	7	20		
Selenium	mg/kg	1.8	167	170	175	166	104	96	75-125	5	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Parameter	Units	2898979		2898980		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10428096001 Result	MS Spike Conc.	MSD Spike Conc.									
Strontium	mg/kg	31.2	167	170	210	211	107	105	75-125	0	20		
Vanadium	mg/kg	40.2	167	170	200	211	96	100	75-125	5	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 535536

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10428176001

SAMPLE DUPLICATE: 2910636

Parameter	Units	10427732013 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	60.7	61.2	1	30	

SAMPLE DUPLICATE: 2910889

Parameter	Units	10429116010 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.5	18.4	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 535771

Analysis Method: EPA 8260B

QC Batch Method: EPA 5035/5030B

Analysis Description: 8260B MSV 5030 Med Level

Associated Lab Samples: 10428176001

METHOD BLANK: 2912043

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1,1-Trichloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1,2-Trichloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	05/03/18 15:30	
1,1-Dichloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,1-Dichloroethene	ug/kg	ND	50.0	05/03/18 15:30	
1,1-Dichloropropene	ug/kg	ND	50.0	05/03/18 15:30	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,2,3-Trichloropropane	ug/kg	ND	200	05/03/18 15:30	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	05/03/18 15:30	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	05/03/18 15:30	
1,2-Dichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,2-Dichloroethane	ug/kg	ND	50.0	05/03/18 15:30	
1,2-Dichloropropane	ug/kg	ND	50.0	05/03/18 15:30	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,3-Dichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
1,3-Dichloropropane	ug/kg	ND	50.0	05/03/18 15:30	
1,4-Dichlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
2,2-Dichloropropane	ug/kg	ND	200	05/03/18 15:30	
2-Butanone (MEK)	ug/kg	ND	250	05/03/18 15:30	
2-Chlorotoluene	ug/kg	ND	50.0	05/03/18 15:30	
4-Chlorotoluene	ug/kg	ND	50.0	05/03/18 15:30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	05/03/18 15:30	
Acetone	ug/kg	ND	1000	05/03/18 15:30	
Allyl chloride	ug/kg	ND	200	05/03/18 15:30	
Benzene	ug/kg	ND	20.0	05/03/18 15:30	
Bromobenzene	ug/kg	ND	50.0	05/03/18 15:30	
Bromochloromethane	ug/kg	ND	50.0	05/03/18 15:30	
Bromodichloromethane	ug/kg	ND	50.0	05/03/18 15:30	
Bromoform	ug/kg	ND	200	05/03/18 15:30	
Bromomethane	ug/kg	ND	500	05/03/18 15:30	
Carbon tetrachloride	ug/kg	ND	50.0	05/03/18 15:30	
Chlorobenzene	ug/kg	ND	50.0	05/03/18 15:30	
Chloroethane	ug/kg	ND	500	05/03/18 15:30	
Chloroform	ug/kg	ND	50.0	05/03/18 15:30	
Chloromethane	ug/kg	ND	200	05/03/18 15:30	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	05/03/18 15:30	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	05/03/18 15:30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

METHOD BLANK: 2912043

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	05/03/18 15:30	
Dibromomethane	ug/kg	ND	50.0	05/03/18 15:30	
Dichlorodifluoromethane	ug/kg	ND	200	05/03/18 15:30	
Dichlorofluoromethane	ug/kg	ND	500	05/03/18 15:30	
Diethyl ether (Ethyl ether)	ug/kg	ND	200	05/03/18 15:30	
Ethylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
Hexachloro-1,3-butadiene	ug/kg	ND	250	05/03/18 15:30	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	05/03/18 15:30	
Methyl-tert-butyl ether	ug/kg	ND	50.0	05/03/18 15:30	
Methylene Chloride	ug/kg	ND	200	05/03/18 15:30	
n-Butylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
n-Propylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
Naphthalene	ug/kg	ND	200	05/03/18 15:30	
p-Isopropyltoluene	ug/kg	ND	50.0	05/03/18 15:30	
sec-Butylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
Styrene	ug/kg	ND	50.0	05/03/18 15:30	
tert-Butylbenzene	ug/kg	ND	50.0	05/03/18 15:30	
Tetrachloroethene	ug/kg	ND	50.0	05/03/18 15:30	
Tetrahydrofuran	ug/kg	ND	2000	05/03/18 15:30	
Toluene	ug/kg	ND	50.0	05/03/18 15:30	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	05/03/18 15:30	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	05/03/18 15:30	
Trichloroethene	ug/kg	ND	50.0	05/03/18 15:30	
Trichlorofluoromethane	ug/kg	ND	200	05/03/18 15:30	
Vinyl chloride	ug/kg	ND	20.0	05/03/18 15:30	
Xylene (Total)	ug/kg	ND	150	05/03/18 15:30	
1,2-Dichloroethane-d4 (S)	%	97	75-125	05/03/18 15:30	
4-Bromofluorobenzene (S)	%	101	75-125	05/03/18 15:30	
Toluene-d8 (S)	%	98	75-125	05/03/18 15:30	

LABORATORY CONTROL SAMPLE & LCSD: 2912044

2912045

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	848	777	85	78	59-125	9	20	
1,1,1-Trichloroethane	ug/kg	1000	818	860	82	86	59-125	5	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	948	878	95	88	58-125	8	20	
1,1,2-Trichloroethane	ug/kg	1000	886	839	89	84	64-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	854	828	85	83	65-125	3	20	
1,1-Dichloroethane	ug/kg	1000	803	815	80	81	63-125	1	20	
1,1-Dichloroethene	ug/kg	1000	827	823	83	82	59-125	1	20	
1,1-Dichloropropene	ug/kg	1000	826	844	83	84	64-125	2	20	
1,2,3-Trichlorobenzene	ug/kg	1000	912	889	91	89	55-126	3	20	
1,2,3-Trichloropropane	ug/kg	1000	980	949	98	95	62-125	3	20	
1,2,4-Trichlorobenzene	ug/kg	1000	913	900	91	90	62-125	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE & LCSD: 2912044		2912045								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	941	882	94	88	59-125	6	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2260	2130	91	85	54-125	6	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	905	812	90	81	64-125	11	20	
1,2-Dichlorobenzene	ug/kg	1000	887	827	89	83	63-125	7	20	
1,2-Dichloroethane	ug/kg	1000	832	759	83	76	57-125	9	20	
1,2-Dichloropropane	ug/kg	1000	879	824	88	82	67-125	6	20	
1,3,5-Trimethylbenzene	ug/kg	1000	917	859	92	86	59-125	6	20	
1,3-Dichlorobenzene	ug/kg	1000	891	827	89	83	64-125	7	20	
1,3-Dichloropropane	ug/kg	1000	887	821	89	82	64-125	8	20	
1,4-Dichlorobenzene	ug/kg	1000	895	820	90	82	63-125	9	20	
2,2-Dichloropropane	ug/kg	1000	796	792	80	79	37-126	0	20	
2-Butanone (MEK)	ug/kg	5000	3900	4060	78	81	48-125	4	20	
2-Chlorotoluene	ug/kg	1000	877	832	88	83	62-125	5	20	
4-Chlorotoluene	ug/kg	1000	904	865	90	86	63-125	4	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4800	4370	96	87	52-135	9	20	
Acetone	ug/kg	5000	4310	4130	86	83	65-125	4	20	
Allyl chloride	ug/kg	1000	754	760	75	76	52-125	1	20	
Benzene	ug/kg	1000	808	828	81	83	61-125	3	20	
Bromobenzene	ug/kg	1000	909	864	91	86	64-125	5	20	
Bromochloromethane	ug/kg	1000	836	838	84	84	65-125	0	20	
Bromodichloromethane	ug/kg	1000	862	810	86	81	57-125	6	20	
Bromoform	ug/kg	1000	701	642	70	64	57-125	9	20	
Bromomethane	ug/kg	1000	737	778	74	78	60-125	5	20	
Carbon tetrachloride	ug/kg	1000	804	838	80	84	58-125	4	20	
Chlorobenzene	ug/kg	1000	903	844	90	84	66-125	7	20	
Chloroethane	ug/kg	1000	714	740	71	74	62-125	4	20	
Chloroform	ug/kg	1000	776	800	78	80	59-125	3	20	
Chloromethane	ug/kg	1000	740	732	74	73	50-125	1	20	
cis-1,2-Dichloroethene	ug/kg	1000	798	766	80	77	61-125	4	20	
cis-1,3-Dichloropropene	ug/kg	1000	889	876	89	88	61-125	1	20	
Dibromochloromethane	ug/kg	1000	791	735	79	74	60-125	7	20	
Dibromomethane	ug/kg	1000	841	811	84	81	69-125	4	20	
Dichlorodifluoromethane	ug/kg	1000	662	654	66	65	38-125	1	20	
Dichlorofluoromethane	ug/kg	1000	756	765	76	76	67-125	1	20	
Diethyl ether (Ethyl ether)	ug/kg	1000	1700	1530	170	153	60-125	10	20	CH,L3
Ethylbenzene	ug/kg	1000	914	855	91	85	62-125	7	20	
Hexachloro-1,3-butadiene	ug/kg	1000	899	802	90	80	56-125	11	20	
Isopropylbenzene (Cumene)	ug/kg	1000	975	891	98	89	65-125	9	20	
Methyl-tert-butyl ether	ug/kg	1000	820	815	82	82	59-125	1	20	
Methylene Chloride	ug/kg	1000	772	790	77	79	64-125	2	20	
n-Butylbenzene	ug/kg	1000	946	868	95	87	59-125	9	20	
n-Propylbenzene	ug/kg	1000	932	888	93	89	61-125	5	20	
Naphthalene	ug/kg	1000	976	921	98	92	53-125	6	20	
p-Isopropyltoluene	ug/kg	1000	918	858	92	86	63-125	7	20	
sec-Butylbenzene	ug/kg	1000	916	858	92	86	62-125	7	20	
Styrene	ug/kg	1000	922	865	92	86	66-125	6	20	
tert-Butylbenzene	ug/kg	1000	949	892	95	89	64-125	6	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE & LCSD: 2912044		2912045								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Tetrachloroethene	ug/kg	1000	916	851	92	85	67-125	7	20	
Tetrahydrofuran	ug/kg	10000	8660	8850	87	89	62-125	2	20	
Toluene	ug/kg	1000	884	829	88	83	61-125	6	20	
trans-1,2-Dichloroethene	ug/kg	1000	794	775	79	78	64-125	2	20	
trans-1,3-Dichloropropene	ug/kg	1000	886	829	89	83	56-125	7	20	
Trichloroethene	ug/kg	1000	891	805	89	80	67-125	10	20	
Trichlorofluoromethane	ug/kg	1000	717	684	72	68	65-125	5	20	
Vinyl chloride	ug/kg	1000	774	772	77	77	57-125	0	20	
Xylene (Total)	ug/kg	3000	2700	2500	90	83	62-125	8	20	
1,2-Dichloroethane-d4 (S)	%				101	98	75-125			
4-Bromofluorobenzene (S)	%				101	103	75-125			
Toluene-d8 (S)	%				100	99	75-125			

MATRIX SPIKE SAMPLE: 2912046		10429096001		Spike		MS		% Rec		Qualifiers
Parameter	Units	Result	Conc.	Result	% Rec	Limit	Qualifiers			
1,1,1,2-Tetrachloroethane	ug/kg	ND	1270	1140	90	64-146				
1,1,1-Trichloroethane	ug/kg	ND	1270	1080	85	56-148				
1,1,2,2-Tetrachloroethane	ug/kg	ND	1270	1260	99	36-150				
1,1,2-Trichloroethane	ug/kg	ND	1270	1210	95	67-148				
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1270	1140	90	60-142				
1,1-Dichloroethane	ug/kg	ND	1270	1100	87	57-140				
1,1-Dichloroethene	ug/kg	ND	1270	1090	86	59-139				
1,1-Dichloropropene	ug/kg	ND	1270	1100	87	61-142				
1,2,3-Trichlorobenzene	ug/kg	ND	1270	1250	98	69-150				
1,2,3-Trichloropropane	ug/kg	ND	1270	1320	104	64-150				
1,2,4-Trichlorobenzene	ug/kg	ND	1270	1240	98	71-149				
1,2,4-Trimethylbenzene	ug/kg	ND	1270	1240	98	67-149				
1,2-Dibromo-3-chloropropane	ug/kg	ND	3160	3090	98	61-150				
1,2-Dibromoethane (EDB)	ug/kg	ND	1270	1190	94	67-147				
1,2-Dichlorobenzene	ug/kg	ND	1270	1170	93	70-142				
1,2-Dichloroethane	ug/kg	ND	1270	1090	86	58-132				
1,2-Dichloropropane	ug/kg	ND	1270	1140	90	64-144				
1,3,5-Trimethylbenzene	ug/kg	ND	1270	1180	93	71-146				
1,3-Dichlorobenzene	ug/kg	ND	1270	1160	92	71-142				
1,3-Dichloropropane	ug/kg	ND	1270	1180	93	68-140				
1,4-Dichlorobenzene	ug/kg	ND	1270	1150	91	68-142				
2,2-Dichloropropane	ug/kg	ND	1270	1060	83	34-150				
2-Butanone (MEK)	ug/kg	ND	6330	5120	81	51-150				
2-Chlorotoluene	ug/kg	ND	1270	1170	92	66-144				
4-Chlorotoluene	ug/kg	ND	1270	1230	97	66-140				
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	6330	6280	99	63-150				
Acetone	ug/kg	ND	6330	5800	90	54-150				
Allyl chloride	ug/kg	ND	1270	1000	79	53-135				
Benzene	ug/kg	ND	1270	1230	97	65-135				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

MATRIX SPIKE SAMPLE: 2912046		10429096001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromobenzene	ug/kg	ND	1270	1230	97	71-141	
Bromochloromethane	ug/kg	ND	1270	1090	86	62-145	
Bromodichloromethane	ug/kg	ND	1270	1140	90	59-148	
Bromoform	ug/kg	ND	1270	937	74	57-145	
Bromomethane	ug/kg	ND	1270	918	69	51-129	
Carbon tetrachloride	ug/kg	ND	1270	1070	85	55-144	
Chlorobenzene	ug/kg	ND	1270	1200	95	70-142	
Chloroethane	ug/kg	ND	1270	957	76	61-135	
Chloroform	ug/kg	ND	1270	1030	81	58-135	
Chloromethane	ug/kg	ND	1270	981	78	37-125	
cis-1,2-Dichloroethene	ug/kg	ND	1270	1040	82	60-138	
cis-1,3-Dichloropropene	ug/kg	ND	1270	1180	93	62-142	
Dibromochloromethane	ug/kg	ND	1270	1080	86	65-141	
Dibromomethane	ug/kg	ND	1270	1150	90	72-150	
Dichlorodifluoromethane	ug/kg	ND	1270	819	65	30-125	
Dichlorofluoromethane	ug/kg	ND	1270	1020	81	62-148	
Diethyl ether (Ethyl ether)	ug/kg	ND	1270	4290	339	62-135	CH,M0
Ethylbenzene	ug/kg	ND	1270	1220	96	72-138	
Hexachloro-1,3-butadiene	ug/kg	ND	1270	1220	96	38-150	
Isopropylbenzene (Cumene)	ug/kg	ND	1270	1280	101	75-148	
Methyl-tert-butyl ether	ug/kg	ND	1270	1080	86	63-139	
Methylene Chloride	ug/kg	ND	1270	1030	79	58-135	
n-Butylbenzene	ug/kg	ND	1270	1250	99	63-150	
n-Propylbenzene	ug/kg	ND	1270	1260	100	70-146	
Naphthalene	ug/kg	ND	1270	1300	102	63-150	
p-Isopropyltoluene	ug/kg	ND	1270	1240	98	72-150	
sec-Butylbenzene	ug/kg	ND	1270	1200	95	66-150	
Styrene	ug/kg	ND	1270	1220	96	72-146	
tert-Butylbenzene	ug/kg	ND	1270	1260	100	71-148	
Tetrachloroethene	ug/kg	ND	1270	1220	97	70-150	
Tetrahydrofuran	ug/kg	ND	12700	11800	93	62-150	
Toluene	ug/kg	ND	1270	1170	93	65-142	
trans-1,2-Dichloroethene	ug/kg	ND	1270	1020	81	55-141	
trans-1,3-Dichloropropene	ug/kg	ND	1270	1170	93	57-147	
Trichloroethene	ug/kg	ND	1270	1170	92	62-150	
Trichlorofluoromethane	ug/kg	ND	1270	958	76	51-150	
Vinyl chloride	ug/kg	ND	1270	1010	80	45-132	
Xylene (Total)	ug/kg	ND	3800	3550	93	75-140	
1,2-Dichloroethane-d4 (S)	%				101	75-125	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				99	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

SAMPLE DUPLICATE: 2912047

Parameter	Units	10429096002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,1-Trichloroethane	ug/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		30	
1,1,2-Trichloroethane	ug/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	ND		30	
1,1-Dichloroethane	ug/kg	ND	ND		30	
1,1-Dichloroethene	ug/kg	ND	ND		30	
1,1-Dichloropropene	ug/kg	ND	ND		30	
1,2,3-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,3-Trichloropropane	ug/kg	ND	ND		30	
1,2,4-Trichlorobenzene	ug/kg	ND	ND		30	
1,2,4-Trimethylbenzene	ug/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		30	
1,2-Dichlorobenzene	ug/kg	ND	ND		30	
1,2-Dichloroethane	ug/kg	ND	ND		30	
1,2-Dichloropropane	ug/kg	ND	ND		30	
1,3,5-Trimethylbenzene	ug/kg	ND	ND		30	
1,3-Dichlorobenzene	ug/kg	ND	ND		30	
1,3-Dichloropropane	ug/kg	ND	ND		30	
1,4-Dichlorobenzene	ug/kg	ND	ND		30	
2,2-Dichloropropane	ug/kg	ND	ND		30	
2-Butanone (MEK)	ug/kg	ND	ND		30	
2-Chlorotoluene	ug/kg	ND	ND		30	
4-Chlorotoluene	ug/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		30	
Acetone	ug/kg	ND	ND		30	
Allyl chloride	ug/kg	ND	ND		30	
Benzene	ug/kg	ND	ND		30	
Bromobenzene	ug/kg	ND	ND		30	
Bromochloromethane	ug/kg	ND	ND		30	
Bromodichloromethane	ug/kg	ND	ND		30	
Bromoform	ug/kg	ND	ND		30	
Bromomethane	ug/kg	ND	ND		30	
Carbon tetrachloride	ug/kg	ND	ND		30	
Chlorobenzene	ug/kg	ND	ND		30	
Chloroethane	ug/kg	ND	ND		30	
Chloroform	ug/kg	ND	ND		30	
Chloromethane	ug/kg	ND	ND		30	
cis-1,2-Dichloroethene	ug/kg	ND	ND		30	
cis-1,3-Dichloropropene	ug/kg	ND	ND		30	
Dibromochloromethane	ug/kg	ND	ND		30	
Dibromomethane	ug/kg	ND	ND		30	
Dichlorodifluoromethane	ug/kg	ND	ND		30	
Dichlorofluoromethane	ug/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/kg	ND	ND		30	
Ethylbenzene	ug/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

SAMPLE DUPLICATE: 2912047

Parameter	Units	10429096002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	ND	ND		30	
Isopropylbenzene (Cumene)	ug/kg	ND	ND		30	
Methyl-tert-butyl ether	ug/kg	ND	ND		30	
Methylene Chloride	ug/kg	ND	ND		30	
n-Butylbenzene	ug/kg	ND	ND		30	
n-Propylbenzene	ug/kg	ND	ND		30	
Naphthalene	ug/kg	ND	ND		30	
p-Isopropyltoluene	ug/kg	ND	ND		30	
sec-Butylbenzene	ug/kg	ND	ND		30	
Styrene	ug/kg	ND	ND		30	
tert-Butylbenzene	ug/kg	ND	ND		30	
Tetrachloroethene	ug/kg	ND	ND		30	
Tetrahydrofuran	ug/kg	ND	ND		30	
Toluene	ug/kg	ND	ND		30	
trans-1,2-Dichloroethene	ug/kg	ND	ND		30	
trans-1,3-Dichloropropene	ug/kg	ND	ND		30	
Trichloroethene	ug/kg	ND	ND		30	
Trichlorofluoromethane	ug/kg	ND	ND		30	
Vinyl chloride	ug/kg	ND	ND		30	
Xylene (Total)	ug/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	98	100	1		
4-Bromofluorobenzene (S)	%.	103	101	5		
Toluene-d8 (S)	%.	98	97	3		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 534409

Analysis Method: EPA 8081B

QC Batch Method: EPA 3550

Analysis Description: 8081S GCS Pesticides

Associated Lab Samples: 10428176001

METHOD BLANK: 2903518

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/kg	ND	3.3	05/04/18 21:08	
4,4'-DDE	ug/kg	ND	3.3	05/04/18 21:08	
4,4'-DDT	ug/kg	ND	3.3	05/04/18 21:08	
Aldrin	ug/kg	ND	1.7	05/04/18 21:08	
alpha-BHC	ug/kg	ND	1.7	05/04/18 21:08	
alpha-Chlordane	ug/kg	ND	1.7	05/04/18 21:08	
beta-BHC	ug/kg	ND	1.7	05/04/18 21:08	
Chlordane (Technical)	ug/kg	ND	16.7	05/04/18 21:08	
delta-BHC	ug/kg	ND	1.7	05/04/18 21:08	
Dieldrin	ug/kg	ND	3.3	05/04/18 21:08	
Endosulfan I	ug/kg	ND	1.7	05/04/18 21:08	
Endosulfan II	ug/kg	ND	3.3	05/04/18 21:08	
Endosulfan sulfate	ug/kg	ND	3.3	05/04/18 21:08	
Endrin	ug/kg	ND	3.3	05/04/18 21:08	
Endrin aldehyde	ug/kg	ND	3.3	05/04/18 21:08	
Endrin ketone	ug/kg	ND	3.3	05/04/18 21:08	
gamma-BHC (Lindane)	ug/kg	ND	1.7	05/04/18 21:08	
gamma-Chlordane	ug/kg	ND	1.7	05/04/18 21:08	
Heptachlor	ug/kg	ND	1.7	05/04/18 21:08	
Heptachlor epoxide	ug/kg	ND	1.7	05/04/18 21:08	
Methoxychlor	ug/kg	ND	16.7	05/04/18 21:08	
Toxaphene	ug/kg	ND	50.0	05/04/18 21:08	
Decachlorobiphenyl (S)	%	85	30-150	05/04/18 21:08	
Tetrachloro-m-xylene (S)	%	92	30-150	05/04/18 21:08	

LABORATORY CONTROL SAMPLE: 2903519

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/kg	33.3	32.8	98	62-127	
4,4'-DDE	ug/kg	33.3	32.3	97	66-125	
4,4'-DDT	ug/kg	33.3	28.6	86	67-128	
Aldrin	ug/kg	16.7	15.8	95	66-125	
alpha-BHC	ug/kg	16.7	16.1	97	64-125	
alpha-Chlordane	ug/kg	16.7	16.1	97	68-125	
beta-BHC	ug/kg	16.7	15.9	95	69-125	
delta-BHC	ug/kg	16.7	13.5	81	42-133	
Dieldrin	ug/kg	33.3	34.6	104	69-126	
Endosulfan I	ug/kg	16.7	15.4	92	63-125	
Endosulfan II	ug/kg	33.3	33.8	101	69-125	
Endosulfan sulfate	ug/kg	33.3	29.3	88	56-137	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE: 2903519

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/kg	33.3	32.2	97	69-125	
Endrin aldehyde	ug/kg	33.3	32.0	96	65-125	
Endrin ketone	ug/kg	33.3	33.7	101	69-129	
gamma-BHC (Lindane)	ug/kg	16.7	16.3	98	67-125	
gamma-Chlordane	ug/kg	16.7	13.5	81	63-125	
Heptachlor	ug/kg	16.7	16.1	96	69-125	
Heptachlor epoxide	ug/kg	16.7	16.4	98	68-125	
Methoxychlor	ug/kg	167	140	84	65-134	
Decachlorobiphenyl (S)	%			85	30-150	
Tetrachloro-m-xylene (S)	%			93	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903520 2903521

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428610001 Result	Spike Conc.	Spike Conc.	MS Result						
4,4'-DDD	ug/kg	<0.38	37.6	37.4	38.5	37.7	102	101	56-125	2	20
4,4'-DDE	ug/kg	0.64J	37.6	37.4	35.3	34.3	92	90	32-150	3	20
4,4'-DDT	ug/kg	3.1J	37.6	37.4	39.5	38.3	97	94	60-132	3	20
Aldrin	ug/kg	<0.33	18.8	18.7	17.0	16.8	90	90	56-125	1	20
alpha-BHC	ug/kg	<0.13	18.8	18.7	17.0	17.0	90	91	54-136	0	20
alpha-Chlordane	ug/kg	<0.16	18.8	18.7	17.4	17.1	93	91	54-133	2	20
beta-BHC	ug/kg	<1.0	18.8	18.7	18.2	18.0	97	96	30-150	1	20
delta-BHC	ug/kg	<0.17	18.8	18.7	15.6	17.8	83	95	45-145	13	20
Dieldrin	ug/kg	1.3J	37.6	37.4	44.9	45.4	116	118	47-150	1	20
Endosulfan I	ug/kg	<0.15	18.8	18.7	16.5	16.3	88	87	35-145	1	20
Endosulfan II	ug/kg	<0.37	37.6	37.4	36.5	35.1	97	94	50-147	4	20
Endosulfan sulfate	ug/kg	0.37J	37.6	37.4	32.7	32.0	86	85	54-132	2	20
Endrin	ug/kg	<0.30	37.6	37.4	35.7	34.3	95	92	62-125	4	20
Endrin aldehyde	ug/kg	<0.36	37.6	37.4	35.3	33.5	94	89	33-150	5	20
Endrin ketone	ug/kg	<0.41	37.6	37.4	47.3	43.0	125	114	56-144	10	20
gamma-BHC (Lindane)	ug/kg	<0.13	18.8	18.7	17.4	17.4	93	93	63-125	0	20
gamma-Chlordane	ug/kg	0.34J	18.8	18.7	14.6	14.1	76	74	45-132	3	20
Heptachlor	ug/kg	<0.35	18.8	18.7	17.7	17.4	94	93	51-142	2	20
Heptachlor epoxide	ug/kg	<0.25	18.8	18.7	18.0	17.5	96	93	50-142	3	20
Methoxychlor	ug/kg	<2.3	188	187	170	163	90	87	58-139	4	20
Decachlorobiphenyl (S)	%						96	87	30-150		
Tetrachloro-m-xylene (S)	%						92	90	30-150		2M, D3

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 533842

Analysis Method: EPA 8082A

QC Batch Method: EPA 3550

Analysis Description: 8082A GCS PCB

Associated Lab Samples: 10428176001

METHOD BLANK: 2899574

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/24/18 11:29	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/24/18 11:29	
Decachlorobiphenyl (S)	%	125	30-134	04/24/18 11:29	CH
Tetrachloro-m-xylene (S)	%	88	48-125	04/24/18 11:29	

LABORATORY CONTROL SAMPLE: 2899575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	527	79	66-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	571	86	62-125	
Decachlorobiphenyl (S)	%			129	30-134	CH
Tetrachloro-m-xylene (S)	%			89	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899651 2899652

Parameter	Units	10428176001		2899652		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
PCB-1016 (Aroclor 1016)	ug/kg	ND	1850	1550	1540	84	84	30-150	0	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	1850	1580	1560	86	84	30-138	2	30	
Decachlorobiphenyl (S)	%					93	76	30-134			CH
Tetrachloro-m-xylene (S)	%					78	68	48-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 534113 Analysis Method: EPA 8270D
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV
Associated Lab Samples: 10428176001

METHOD BLANK: 2901626 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/25/18 17:49	
1,2-Dichlorobenzene	ug/kg	ND	330	04/25/18 17:49	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/25/18 17:49	
1,3-Dichlorobenzene	ug/kg	ND	330	04/25/18 17:49	
1,4-Dichlorobenzene	ug/kg	ND	330	04/25/18 17:49	
1-Methylnaphthalene	ug/kg	ND	330	04/25/18 17:49	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/25/18 17:49	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/25/18 17:49	
2,4-Dichlorophenol	ug/kg	ND	330	04/25/18 17:49	
2,4-Dimethylphenol	ug/kg	ND	330	04/25/18 17:49	
2,4-Dinitrophenol	ug/kg	ND	330	04/25/18 17:49	
2,4-Dinitrotoluene	ug/kg	ND	330	04/25/18 17:49	
2,6-Dinitrotoluene	ug/kg	ND	330	04/25/18 17:49	
2-Chloronaphthalene	ug/kg	ND	330	04/25/18 17:49	
2-Chlorophenol	ug/kg	ND	330	04/25/18 17:49	
2-Methylnaphthalene	ug/kg	ND	330	04/25/18 17:49	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/25/18 17:49	
2-Nitroaniline	ug/kg	ND	330	04/25/18 17:49	
2-Nitrophenol	ug/kg	ND	330	04/25/18 17:49	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/25/18 17:49	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/25/18 17:49	
3-Nitroaniline	ug/kg	ND	330	04/25/18 17:49	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/25/18 17:49	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/25/18 17:49	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/25/18 17:49	
4-Chloroaniline	ug/kg	ND	330	04/25/18 17:49	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/25/18 17:49	
4-Nitroaniline	ug/kg	ND	330	04/25/18 17:49	
4-Nitrophenol	ug/kg	ND	330	04/25/18 17:49	
Acenaphthene	ug/kg	ND	330	04/25/18 17:49	
Acenaphthylene	ug/kg	ND	330	04/25/18 17:49	
Anthracene	ug/kg	ND	330	04/25/18 17:49	
Benzo(a)anthracene	ug/kg	ND	330	04/25/18 17:49	
Benzo(a)pyrene	ug/kg	ND	330	04/25/18 17:49	
Benzo(b)fluoranthene	ug/kg	ND	330	04/25/18 17:49	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/25/18 17:49	
Benzo(k)fluoranthene	ug/kg	ND	330	04/25/18 17:49	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/25/18 17:49	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/25/18 17:49	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/25/18 17:49	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/25/18 17:49	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

METHOD BLANK: 2901626

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/25/18 17:49	
Carbazole	ug/kg	ND	330	04/25/18 17:49	
Chrysene	ug/kg	ND	330	04/25/18 17:49	
Di-n-butylphthalate	ug/kg	ND	330	04/25/18 17:49	
Di-n-octylphthalate	ug/kg	ND	330	04/25/18 17:49	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/25/18 17:49	
Dibenzofuran	ug/kg	ND	330	04/25/18 17:49	
Diethylphthalate	ug/kg	ND	330	04/25/18 17:49	
Dimethylphthalate	ug/kg	ND	330	04/25/18 17:49	
Fluoranthene	ug/kg	ND	330	04/25/18 17:49	
Fluorene	ug/kg	ND	330	04/25/18 17:49	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/25/18 17:49	
Hexachlorobenzene	ug/kg	ND	330	04/25/18 17:49	
Hexachloroethane	ug/kg	ND	330	04/25/18 17:49	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/25/18 17:49	
Isophorone	ug/kg	ND	330	04/25/18 17:49	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/25/18 17:49	
N-Nitrosodimethylamine	ug/kg	ND	330	04/25/18 17:49	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/25/18 17:49	
Naphthalene	ug/kg	ND	330	04/25/18 17:49	
Nitrobenzene	ug/kg	ND	330	04/25/18 17:49	
Pentachlorophenol	ug/kg	ND	670	04/25/18 17:49	
Phenanthrene	ug/kg	ND	330	04/25/18 17:49	
Phenol	ug/kg	ND	330	04/25/18 17:49	
Pyrene	ug/kg	ND	330	04/25/18 17:49	
2,4,6-Tribromophenol (S)	%	87	60-125	04/25/18 17:49	
2-Fluorobiphenyl (S)	%	84	30-132	04/25/18 17:49	
2-Fluorophenol (S)	%	80	40-125	04/25/18 17:49	
Nitrobenzene-d5 (S)	%	79	43-125	04/25/18 17:49	
p-Terphenyl-d14 (S)	%	97	62-125	04/25/18 17:49	
Phenol-d6 (S)	%	79	48-125	04/25/18 17:49	

LABORATORY CONTROL SAMPLE: 2901627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1340	80	46-125	
1,2-Dichlorobenzene	ug/kg	1670	1330	80	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1450	87	63-125	
1,3-Dichlorobenzene	ug/kg	1670	1280	77	38-125	
1,4-Dichlorobenzene	ug/kg	1670	1290	77	39-125	
1-Methylnaphthalene	ug/kg	1670	1400	84	56-125	
2,4,5-Trichlorophenol	ug/kg	1670	1480	89	63-125	
2,4,6-Trichlorophenol	ug/kg	1670	1490	89	61-125	
2,4-Dichlorophenol	ug/kg	1670	1450	87	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE: 2901627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1400	84	51-125	
2,4-Dinitrophenol	ug/kg	1670	1400	84	30-132	
2,4-Dinitrotoluene	ug/kg	1670	1760	105	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1630	98	63-125	
2-Chloronaphthalene	ug/kg	1670	1440	86	61-125	
2-Chlorophenol	ug/kg	1670	1380	83	46-125	
2-Methylnaphthalene	ug/kg	1670	1380	83	55-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1350	81	50-125	
2-Nitroaniline	ug/kg	1670	1470	88	61-125	
2-Nitrophenol	ug/kg	1670	1450	87	43-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1400	84	54-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1530	92	47-125	
3-Nitroaniline	ug/kg	1670	1480	89	57-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1670J	100	30-141	
4-Bromophenylphenyl ether	ug/kg	1670	1460	88	63-125	
4-Chloro-3-methylphenol	ug/kg	1670	1510	90	64-125	
4-Chloroaniline	ug/kg	1670	1190	71	36-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1490	90	64-125	
4-Nitroaniline	ug/kg	1670	1490	89	59-125	
4-Nitrophenol	ug/kg	1670	1440	86	54-125	
Acenaphthene	ug/kg	1670	1440	87	62-125	
Acenaphthylene	ug/kg	1670	1430	86	61-125	
Anthracene	ug/kg	1670	1480	89	66-125	
Benzo(a)anthracene	ug/kg	1670	1610	97	69-125	
Benzo(a)pyrene	ug/kg	1670	1590	95	67-125	
Benzo(b)fluoranthene	ug/kg	1670	1570	94	67-125	
Benzo(g,h,i)perylene	ug/kg	1670	1650	99	63-125	
Benzo(k)fluoranthene	ug/kg	1670	1590	96	68-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1340	80	52-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1270	76	41-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1130	68	37-125 3M	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1850	111	69-131	
Butylbenzylphthalate	ug/kg	1670	1770	106	69-129	
Carbazole	ug/kg	1670	1600	96	66-125	
Chrysene	ug/kg	1670	1580	95	68-125	
Di-n-butylphthalate	ug/kg	1670	1710	102	69-125	
Di-n-octylphthalate	ug/kg	1670	1870	112	69-133	
Dibenz(a,h)anthracene	ug/kg	1670	1690	101	64-125	
Dibenzofuran	ug/kg	1670	1490	90	65-125	
Diethylphthalate	ug/kg	1670	1610	97	67-125	
Dimethylphthalate	ug/kg	1670	1580	95	67-125	
Fluoranthene	ug/kg	1670	1570	94	66-125	
Fluorene	ug/kg	1670	1500	90	66-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1280	77	40-125	
Hexachlorobenzene	ug/kg	1670	1480	89	62-125	
Hexachloroethane	ug/kg	1670	1310	79	33-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1660	99	64-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

LABORATORY CONTROL SAMPLE: 2901627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1350	81	57-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1350	81	50-125	
N-Nitrosodimethylamine	ug/kg	1670	1350	81	36-125	
N-Nitrosodiphenylamine	ug/kg	1670	1550	93	65-125	
Naphthalene	ug/kg	1670	1330	80	48-125	
Nitrobenzene	ug/kg	1670	1310	79	48-125	
Pentachlorophenol	ug/kg	1670	1140	68	41-125	
Phenanthrene	ug/kg	1670	1480	89	66-125	
Phenol	ug/kg	1670	1320	79	46-125	
Pyrene	ug/kg	1670	1620	97	69-125	
2,4,6-Tribromophenol (S)	%			86	60-125	
2-Fluorobiphenyl (S)	%			75	30-132	
2-Fluorophenol (S)	%			73	40-125	
Nitrobenzene-d5 (S)	%			70	43-125	
p-Terphenyl-d14 (S)	%			91	62-125	
Phenol-d6 (S)	%			71	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2901628 2901629

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427377010 Result	Spike Conc.	Spike Conc.	MS Result						
1,2,4-Trichlorobenzene	ug/kg	<760	1970	1970	1360J	1370J	69	69	30-127	30	
1,2-Dichlorobenzene	ug/kg	<739	1970	1970	1450J	1360J	73	69	30-125	30	
1,2-Diphenylhydrazine	ug/kg	<707	1970	1970	1310J	1300J	66	66	30-150	30	
1,3-Dichlorobenzene	ug/kg	<730	1970	1970	1440J	1320J	73	67	30-125	30	
1,4-Dichlorobenzene	ug/kg	<713	1970	1970	1410J	1380J	71	70	30-125	30	
1-Methylnaphthalene	ug/kg	<615	1970	1970	1490J	1420J	75	72	42-125	30	
2,4,5-Trichlorophenol	ug/kg	<764	1970	1970	1250J	1360J	63	69	30-150	30	
2,4,6-Trichlorophenol	ug/kg	<556	1970	1970	1380J	1310J	70	66	30-150	30	
2,4-Dichlorophenol	ug/kg	<738	1970	1970	1390J	1330J	71	67	30-135	30	
2,4-Dimethylphenol	ug/kg	<1470	1970	1970	ND	ND	73	74	30-148	30	
2,4-Dinitrophenol	ug/kg	<880	1970	1970	ND	ND	0	0	30-125	30	M1
2,4-Dinitrotoluene	ug/kg	<530	1970	1970	904J	789J	46	40	30-150	30	
2,6-Dinitrotoluene	ug/kg	<546	1970	1970	1050J	867J	53	44	30-150	30	
2-Chloronaphthalene	ug/kg	<556	1970	1970	1480J	1410J	75	72	30-138	30	
2-Chlorophenol	ug/kg	<778	1970	1970	1390J	1400J	70	71	30-130	30	
2-Methylnaphthalene	ug/kg	<607	1970	1970	1460J	1440J	74	73	46-125	30	
2-Methylphenol(o-Cresol)	ug/kg	<986	1970	1970	1420J	1380J	72	70	30-133	30	
2-Nitroaniline	ug/kg	<865	1970	1970	1630J	1670J	82	84	30-150	30	
2-Nitrophenol	ug/kg	<737	1970	1970	825J	ND	42	33	30-134	30	
3&4-Methylphenol(m&p Cresol)	ug/kg	<883	1970	1970	1430J	1390J	72	70	30-138	30	
3,3'-Dichlorobenzidine	ug/kg	<936	1970	1970	1190J	1310J	60	66	30-149	30	
3-Nitroaniline	ug/kg	<959	1970	1970	1810J	1880J	92	95	30-150	30	
4,6-Dinitro-2-methylphenol	ug/kg	<1580	1970	1970	ND	ND	0	0	30-133	30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2901628		2901629									
Parameter	Units	10427377010	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
4-Bromophenylphenyl ether	ug/kg	<660	1970	1970	1360J	1300J	69	66	44-125			30	
4-Chloro-3-methylphenol	ug/kg	<543	1970	1970	1440J	1350J	73	68	30-150			30	
4-Chloroaniline	ug/kg	<1100	1970	1970	ND	ND	52	56	30-125			30	
4-Chlorophenylphenyl ether	ug/kg	<536	1970	1970	1390J	1440J	70	73	44-125			30	
4-Nitroaniline	ug/kg	<698	1970	1970	1710J	1610J	87	81	30-150			30	
4-Nitrophenol	ug/kg	<1130	1970	1970	ND	ND	46	53	30-150			30	
Acenaphthene	ug/kg	<641	1970	1970	1380J	1400J	70	71	40-125			30	
Acenaphthylene	ug/kg	<537	1970	1970	1480J	1450J	75	73	30-150			30	
Anthracene	ug/kg	<564	1970	1970	1470J	1400J	74	71	30-150			30	
Benzo(a)anthracene	ug/kg	<455	1970	1970	1570J	1600J	79	81	30-150			30	
Benzo(a)pyrene	ug/kg	<443	1970	1970	1520J	1460J	77	74	30-150			30	
Benzo(b)fluoranthene	ug/kg	<474	1970	1970	1570J	1570J	79	79	30-150			30	
Benzo(g,h,i)perylene	ug/kg	<339	1970	1970	1630J	1520J	83	77	30-150			30	
Benzo(k)fluoranthene	ug/kg	<474	1970	1970	1510J	1500J	77	76	30-150			30	
bis(2-Chloroethoxy)methane	ug/kg	<760	1970	1970	1390J	1360J	70	69	30-134			30	
bis(2-Chloroethyl) ether	ug/kg	<858	1970	1970	1360J	1250J	69	63	30-125			30	
bis(2-Chloroisopropyl) ether	ug/kg	<909	1970	1970	1330J	1270J	67	64	30-125			30	
bis(2-Ethylhexyl)phthalate	ug/kg	<1000	1970	1970	1950J	1980J	99	100	30-150			30	
Butylbenzylphthalate	ug/kg	<867	1970	1970	1740J	1710J	88	87	30-150			30	
Carbazole	ug/kg	<526	1970	1970	1520J	1480J	77	75	41-125			30	
Chrysene	ug/kg	<393	1970	1970	1680J	1610J	85	82	30-150			30	
Di-n-butylphthalate	ug/kg	<536	1970	1970	1680J	1540J	85	78	30-150			30	
Di-n-octylphthalate	ug/kg	<1200	1970	1970	1820J	1780J	92	90	30-150			30	
Dibenz(a,h)anthracene	ug/kg	<404	1970	1970	1550J	1530J	78	78	30-150			30	
Dibenzofuran	ug/kg	<569	1970	1970	1480J	1460J	75	74	45-125			30	
Diethylphthalate	ug/kg	<464	1970	1970	1500J	1500J	76	76	30-150			30	
Dimethylphthalate	ug/kg	<603	1970	1970	1450J	1460J	73	74	30-150			30	
Fluoranthene	ug/kg	<418	1970	1970	1580J	1540J	74	72	30-150			30	
Fluorene	ug/kg	<546	1970	1970	1510J	1450J	77	73	30-150			30	
Hexachloro-1,3-butadiene	ug/kg	<903	1970	1970	1350J	1360J	68	69	30-128			30	
Hexachlorobenzene	ug/kg	<506	1970	1970	1450J	1410J	73	71	30-150			30	
Hexachloroethane	ug/kg	<801	1970	1970	ND	ND	33	26	30-125			30	M1
Indeno(1,2,3-cd)pyrene	ug/kg	<456	1970	1970	1580J	1420J	80	72	30-150			30	
Isophorone	ug/kg	<898	1970	1970	1460J	1410J	74	72	30-140			30	
N-Nitroso-di-n-propylamine	ug/kg	<1200	1970	1970	1440J	1400J	73	71	30-147			30	
N-Nitrosodimethylamine	ug/kg	<1020	1970	1970	1430J	1420J	72	72	30-125			30	
N-Nitrosodiphenylamine	ug/kg	<481	1970	1970	1460J	1480J	74	75	30-150			30	
Naphthalene	ug/kg	<745	1970	1970	1460J	1420J	74	72	44-125			30	
Nitrobenzene	ug/kg	<787	1970	1970	1410J	1240J	71	63	30-136			30	
Pentachlorophenol	ug/kg	<1160	1970	1970	ND	ND	15	15	30-150			30	M1
Phenanthrene	ug/kg	<537	1970	1970	1610J	1570J	82	80	30-150			30	
Phenol	ug/kg	<757	1970	1970	1430J	1380J	72	70	30-129			30	
Pyrene	ug/kg	<412	1970	1970	1820J	1860J	81	83	30-150			30	
2,4,6-Tribromophenol (S)	%						59	58	60-125				S0
2-Fluorobiphenyl (S)	%						68	64	30-132				
2-Fluorophenol (S)	%						63	61	40-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Parameter	Units	2901628		2901629		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.					58	57	43-125			P3
p-Terphenyl-d14 (S)	%.					78	77	62-125			
Phenol-d6 (S)	%.					64	60	48-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 533722 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10428176001

METHOD BLANK: 2899091 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/24/18 15:03	
Acenaphthylene	ug/kg	ND	10.0	04/24/18 15:03	
Anthracene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(a)anthracene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(a)pyrene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/24/18 15:03	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/24/18 15:03	
Chrysene	ug/kg	ND	10.0	04/24/18 15:03	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/24/18 15:03	
Fluoranthene	ug/kg	ND	10.0	04/24/18 15:03	
Fluorene	ug/kg	ND	10.0	04/24/18 15:03	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/24/18 15:03	
Naphthalene	ug/kg	ND	10.0	04/24/18 15:03	
Phenanthrene	ug/kg	ND	10.0	04/24/18 15:03	
Pyrene	ug/kg	ND	10.0	04/24/18 15:03	
2-Fluorobiphenyl (S)	%	93	42-125	04/24/18 15:03	
p-Terphenyl-d14 (S)	%	92	57-125	04/24/18 15:03	

LABORATORY CONTROL SAMPLE: 2899092

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	26.7	80	52-125	
Acenaphthylene	ug/kg	33.3	26.2	79	50-125	
Anthracene	ug/kg	33.3	29.7	89	65-125	
Benzo(a)anthracene	ug/kg	33.3	27.0	81	60-125	
Benzo(a)pyrene	ug/kg	33.3	23.6	71	69-125	
Benzo(b)fluoranthene	ug/kg	33.3	27.4	82	61-125	
Benzo(g,h,i)perylene	ug/kg	33.3	24.6	74	60-125	
Benzo(k)fluoranthene	ug/kg	33.3	26.9	81	67-125	
Chrysene	ug/kg	33.3	27.8	83	67-125	
Dibenz(a,h)anthracene	ug/kg	33.3	21.8	65	63-125	
Fluoranthene	ug/kg	33.3	30.7	92	75-125	
Fluorene	ug/kg	33.3	26.4	79	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	24.3	73	63-125	
Naphthalene	ug/kg	33.3	26.3	79	49-125	
Phenanthrene	ug/kg	33.3	27.8	84	65-125	
Pyrene	ug/kg	33.3	24.8	74	64-125	
2-Fluorobiphenyl (S)	%			87	42-125	
p-Terphenyl-d14 (S)	%			82	57-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899093		2899094		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10428180001 Result	MS Spike Conc.	MSD Spike Conc.									
Acenaphthene	ug/kg	ND	35.7	35.7	30.3	29.4	85	82	30-125	3	30		
Acenaphthylene	ug/kg	ND	35.7	35.7	26.0	29.8	73	83	30-133	13	30		
Anthracene	ug/kg	ND	35.7	35.7	42.2	36.4	118	102	30-150	15	30		
Benzo(a)anthracene	ug/kg	0.020 mg/kg	35.7	35.7	67.8	46.1	135	74	30-150	38	30	R1	
Benzo(a)pyrene	ug/kg	0.019 mg/kg	35.7	35.7	59.8	43.3	113	67	30-150	32	30	R1	
Benzo(b)fluoranthene	ug/kg	0.028 mg/kg	35.7	35.7	68.5	51.4	113	65	30-150	29	30		
Benzo(g,h,i)perylene	ug/kg	0.018 mg/kg	35.7	35.7	63.9	51.6	128	94	30-150	21	30		
Benzo(k)fluoranthene	ug/kg	0.012 mg/kg	35.7	35.7	38.9	37.9	76	74	30-150	3	30		
Chrysene	ug/kg	0.022 mg/kg	35.7	35.7	65.9	46.5	121	67	30-150	35	30	R1	
Dibenz(a,h)anthracene	ug/kg	ND	35.7	35.7	38.4	37.7	107	105	30-131	2	30		
Fluoranthene	ug/kg	0.044 mg/kg	35.7	35.7	109	66.2	182	63	30-150	49	30	M1,R1	
Fluorene	ug/kg	ND	35.7	35.7	28.1	28.4	79	79	30-147	1	30		
Indeno(1,2,3-cd)pyrene	ug/kg	0.016 mg/kg	35.7	35.7	57.8	47.7	117	89	30-150	19	30		
Naphthalene	ug/kg	ND	35.7	35.7	21.8	26.9	61	75	30-131	21	30		
Phenanthrene	ug/kg	0.020 mg/kg	35.7	35.7	81.1	49.7	171	84	30-150	48	30	M1,R1	
Pyrene	ug/kg	0.034 mg/kg	35.7	35.7	98.8	58.0	181	67	30-150	52	30	M1,R1	
2-Fluorobiphenyl (S)	%.						70	84	42-125				
p-Terphenyl-d14 (S)	%.						73	80	57-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 533864 Analysis Method: WI MOD DRO

QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS

Associated Lab Samples: 10428176001

METHOD BLANK: 2899660

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	04/25/18 13:36	
n-Triacontane (S)	%.	95	50-150	04/25/18 13:36	

LABORATORY CONTROL SAMPLE & LCSD: 2899661

2899662

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	66.3	60.3	83	75	70-120	9	20	
n-Triacontane (S)	%.				93	93	50-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 439469	Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A	Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10428176001	

METHOD BLANK: 2030574 Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	04/30/18 13:42	

LABORATORY CONTROL SAMPLE: 2030575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1100	980	89	80-120	

SAMPLE DUPLICATE: 2030580

Parameter	Units	10427642002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

QC Batch: 287059

Analysis Method: EPA 9012

QC Batch Method: EPA 9012A

Analysis Description: 9012 Cyanide

Associated Lab Samples: 10428176001

METHOD BLANK: 1679101

Matrix: Solid

Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/26/18 14:20	

LABORATORY CONTROL SAMPLE: 1679102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	3.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1679103 1679104

Parameter	Units	10428176001		1679103		1679104		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Cyanide	mg/kg	ND	10.3	10.3	8.3	10.9	71	95	80-120	27	20 M0,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

QC Batch: 141540 Analysis Method: EPA 9056A
QC Batch Method: EPA 300.0 Analysis Description: 9056 IC Anions, Soil
Associated Lab Samples: 10428176001

METHOD BLANK: 559769 Matrix: Solid
Associated Lab Samples: 10428176001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/kg	ND	0.99	04/30/18 17:39	

LABORATORY CONTROL SAMPLE: 559768

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/kg	50.3	51.9	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559770 559771

Parameter	Units	10428096003 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	Max		Qual
			Spike Conc.	Conc.	Result	Result					RPD	RPD	
Fluoride	mg/kg	ND	50	49.3	11.4	12.3	23	25	80-120	7	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559772 559773

Parameter	Units	10428159006 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	Max		Qual
			Spike Conc.	Conc.	Result	Result					RPD	RPD	
Fluoride	mg/kg	0.97 U	49.7	48.9	35.9	41.7	72	85	80-120	15	20	M1	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid
Pace Project No.: 10428176

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-DUL Pace Analytical Services - Duluth
PASI-G Pace Analytical Services - Green Bay
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10428176

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M Sample was brown in color.
2M Sample was yellow in color.
3M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D4 Sample was diluted due to the presence of high levels of target analytes.
E Analyte concentration exceeded the calibration range. The reported result is estimated.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

ANALYTE QUALIFIERS

- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter.
- N3 Accreditation is not offered by the relevant laboratory accrediting body for this parameter.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.
- T6 High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Solid

Pace Project No.: 10428176

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428176001	FL-TT-08 (1-7 WM)	EPA 1630 (1998)	142287	EPA 1630 (1998)	142288
10428176001	FL-TT-08 (1-7 WM)	EPA 3550	534409	EPA 8081B	534839
10428176001	FL-TT-08 (1-7 WM)	EPA 3550	533842	EPA 8082A	533945
10428176001	FL-TT-08 (1-7 WM)	WI MOD DRO	533864	WI MOD DRO	534349
10428176001	FL-TT-08 (1-7 WM)	EPA 5030 Medium Soil	535880	WI MOD GRO	535956
10428176001	FL-TT-08 (1-7 WM)	EPA 3050	533686	EPA 6010C	534230
10428176001	FL-TT-08 (1-7 WM)	EPA 3050B	438855	EPA 6020	439080
10428176001	FL-TT-08 (1-7 WM)	EPA 3050	533687	EPA 6020A	533858
10428176001	FL-TT-08 (1-7 WM)	EPA 7471	533683	EPA 7471	533810
10428176001	FL-TT-08 (1-7 WM)	ASTM D2974	535536		
10428176001	FL-TT-08 (1-7 WM)	EPA 3550	534113	EPA 8270D	534319
10428176001	FL-TT-08 (1-7 WM)	EPA 3550	533722	EPA 8270D by SIM	534081
10428176001	FL-TT-08 (1-7 WM)	EPA 5035/5030B	535771	EPA 8260B	536093
10428176001	FL-TT-08 (1-7 WM)	EPA 3060A	439469	EPA 7196A	439714
10428176001	FL-TT-08 (1-7 WM)	Trivalent Chromium Calculation	440734		
10428176001	FL-TT-08 (1-7 WM)	EPA 9012A	287059	EPA 9012	287085
10428176001	FL-TT-08 (1-7 WM)	EPA 300.0	141540	EPA 9056A	141561

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WO#: 10428176



10428176

Body Form

Work Order Number:

COC Type:

Page: 1 of 1

Turnaround Time:

COC ID:

FOR LAB USE ONLY

CLIENT INFO

LABORATORY

Facility Code:	MNSW-057/MPCA Freeway LF	Program Code (MDH Lab Only):	Lab Name:
Project Name:	MPCA Freeway LF Solids	Project Task Code:	Address: 18-00383
Project Manager:			EPIC Profile # 38716
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				PRESERV.	ANALYSIS	Lab Sample No.	#		
Sample=Routine Sample	QC-FB=Field Blank Sample	S-IVP=Integrated Vertical Profile Sample	QC-FR=Field Replicate Sample	DW=Drinking Water	AR=Air	Wtr-Ground=Groundwater	Wtr-Surf=Surface Water	QC-BLANK=Artificial Blank Water	Leachate=Leachate Sample								
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont						
FL-77-08 (1-7 Wm)	S	4/20/18		1	7	C	SD				13	X	See attached for solids/waste Includ. Dioxin			001	1
JAK 4/20/18																	
																	2
																	3
																	4
																	5
																	6
																	7
																	8
																	9
																	10

Sampled By: Jack Kobkimon/Zack Eckstrom Sampler's Signature: *[Signature]* Phone #: 612-437-5651

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<i>[Signature]</i>	4/20/18 1730	<i>[Signature]</i>	4/20/18 17:30

T=6.5°C

Sample Condition Upon Receipt

Client Name:

Project #:

WO#: 10428176

MPCA

PM: JMA Due Date: 05/07/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____

Temp Blank? Yes No

Thermometer 151401163
Used: G87A9155100842

Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.5 Cooler Temp Corrected (°C): 6.5 Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C Correction Factor: True Date and Initials of Person Examining Contents: JE 4-20-18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. <u>No time on COC or Sample</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>0305183</u>		No Trip Blank Received JMA 4/23/18

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: Brad Jacobson

Date/Time: _____

Comments/Resolution: Confirmed collected time for samples is 14:30.

Project Manager Review:

[Signature]

Date: 04/23/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of time, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
SOIL and WASTE MATERIAL
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List S	Methods
Metals	
Aluminum, Barium, Boron, Copper, Iron, Manganese, Nickel, Silver, Tin, Titanium, Zinc	EPA 6010C
Add Chromium (<i>needed for Cr III calc</i>)	
Antimony, Arsenic, Beryllium, Cadmium, Chromium III (calculated), Cobalt, Lead, Lithium, Selenium, Strontium, Vanadium	EPA 6020A
Chromium VI	EPA 7196
Copper Cyanide Test as Total Cyanide	EPA 9012
Fluoride, test as Total Fluoride	EPA 9056A
Mercury	EPA 7471
Methyl Mercury	EPA 1630
Dioxins 2,3,7,8 TCDD*	EPA 8290
Pesticides (DDT, DDE, DDD, etc)	EPA 8081A
Herbicides	MDA List II
PCBs	EPA 8082
PAHs (standard list)	EPA 8270 SIM
SVOCs	EPA 8270
VOCs	EPA 8260
GRO	WI-GRO
DRO	WI-DRO

* Assumed that Dioxin analysis shall only be requested for approximately half of the samples. To be determined in the field by MPCA staff.

Sample Condition Upon Receipt

Client Name: Pace MN

Project # _____

WO# : 12107527
 PM: HRZ Due Date: 05/07/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Optional: Proj. Due Date: _____ Proj. Name: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.4 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: HRZ 4/25/18 DC

Comments: BM 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
 F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN
 Project #: _____

WO# : 12107527
 PM: HRZ Due Date: 05/07/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.5 Cooler Temp Corrected °C: 0.8 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: ±0.3 Date and Initials of Person Examining Contents: 4-24-18 DL

Comments: B m 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Angela Loisel Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

40167846
Pace Analytical
www.pacelabs.com

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428176 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/20/2018 Results Requested By: 5/7/2018

Report To		Subcontract To					Requested Analysis																
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436					Total Cyanide by 9012																
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers												LAB USE ONLY					
						Unpreserved																	
1	FL-TT-08 (1-7 WM)	PS	4/20/2018 14:30	10428176001	Solid	1																001	
2																							
3																							
4																							
5																							
Transfers																		Comments					
Transfers	Released By	Date/Time	Received By	Date/Time																			
1	<i>[Signature]</i>	4/23/18 17:20	<i>[Signature]</i>																				
2	<i>[Signature]</i>	4/24/18 08:15	<i>[Signature]</i>	4/24/18 08:15																			
3																							
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																	
3 °C		Y or N		Y or N		Y or N																	

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Client Name: Pace, MN Sample Preservation Receipt Form
 Project # 40167896

All containers needing preservation have been checked and noted below: Yes No N/A

Lab Lot# of pH paper: _____

Lab Std #ID of preservation (if pH adjusted): _____

Initial when completed: _____

Date/Time: _____

Pace Lab #	Glass							Plastic						Vials					Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)							
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T								ZPLC	GN					
001																																						2.5 / 5 / 10
002																																						2.5 / 5 / 10
003																																						2.5 / 5 / 10
004																																						2.5 / 5 / 10
005																																						2.5 / 5 / 10
006																																						2.5 / 5 / 10
007																																						2.5 / 5 / 10
008																																						2.5 / 5 / 10
009																																						2.5 / 5 / 10
010																																						2.5 / 5 / 10
011																																						2.5 / 5 / 10
012																																						2.5 / 5 / 10
013																																						2.5 / 5 / 10
014																																						2.5 / 5 / 10
015																																						2.5 / 5 / 10
016																																						2.5 / 5 / 10
017																																						2.5 / 5 / 10
018																																						2.5 / 5 / 10
019																																						2.5 / 5 / 10
020																																						2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : Yes No N/A *If yes look in headspace column

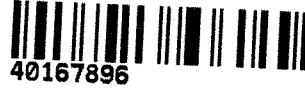
AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN

Project #: _____

WO#: 40167896



Courier: CS Logistics Fed Ex Speedee UPS ~~Waltco~~
 Client Pace Other: _____

Tracking #: 16999608

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 4 Type of Ice Wet Blue Dry None

Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 35 / Corr: 3

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 4-24-18
Initials: SCU

Temp should be above freezing to 6°C.

Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	MS/MSD <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: CW

Date: 4/24/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428176 Workorder Name: 18-00383 MPCA Freeway LF Solid Owner Received Date: 4/20/2018 Results Requested By: 5/7/2018

Report To		Subcontract To					Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100																				
							Preserved Containers			Chromium III			Chromium VI			Total Cr by 6020			56195169			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																
1	FL-TT-08 (1-7 WM)	PS	4/20/2018 14:30	10428176001	Solid	1						X	X	X								
2																						
3																						
4																						
5																						
												Comments										
Transfers	Released By	Date/Time	Received By	Date/Time																		
1	<i>[Signature]</i>	4/23/18 1710	fedex																			
2	fedex	4-24-18 0825	Jason Hilluff	4-24-18 0825																		
3																						
Cooler Temperature on Receipt 3.4 °C		Custody Seal <input checked="" type="checkbox"/> or N			Received on Ice <input checked="" type="checkbox"/> or N			Samples Intact <input checked="" type="checkbox"/> or N														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50195169

Date/Time and Initials of person examining contents: JH 4-24-18 1232

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2803

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 39/39 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<input checked="" type="checkbox"/>
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC? Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

May 04, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Solid - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/24/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kari-Ann Killian For Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428176
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-TT-08 (1-7 WM) (10428176001)	A181703-01	Solid	04/20/2018	04/24/2018

CASE NARRATIVE

Sample Receipt Information:

One sample was received on April 24, 2018. Sample was received at 3.1 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428176
 Project Manager: Jennifer Anderson

FL-TT-08 (1-7 WM) (10428176001)
A181703-01 (Solid)

Date Sampled
04/20/2018 14:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A804197

2,4-D	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 01:22	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 06:23	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 01:22	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 06:23	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 01:22	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 01:22	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 01:22	EPA 8321B	
Picloram	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 01:22	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/26/2018	05/02/2018 01:22	EPA 8321B	

Surrogate: DCAA 83.2 % 70.8-116 04/26/2018 05/02/2018 01:22 EPA 8321B

Classical Chemistry Parameters

Preparation Batch: A804195

% Solids	47.9	0.00	% by Weight	1	04/25/2018	04/27/2018 09:07	SM 2540B	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428176
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

Blank (A804197-BLK1)		Prepared: 04/26/2018 Analyzed: 04/27/2018 01:46								
2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	21.3		mg/kg wet	20.00		107	70.8-116			
Surrogate: DCAA [2C]	20.2		mg/kg wet	20.00		101	62.3-114			

LCS (A804197-BS1)		Prepared: 04/26/2018 Analyzed: 04/26/2018 23:32								
2,4-D	1.91	0.10	mg/kg wet	2.000		95.3	81.6-107			
2,4-D [2C]	1.87	0.10	mg/kg wet	2.000		93.4	71.8-120			
2,4-DB	1.75	0.10	mg/kg wet	2.000		87.5	76.4-107			
2,4-DB [2C]	1.90	0.10	mg/kg wet	2.000		95.1	62.2-129			
2,4,5-T	1.94	0.10	mg/kg wet	2.000		97.1	81.2-110			
2,4,5-T [2C]	1.99	0.10	mg/kg wet	2.000		99.6	70.6-125			
2,4,5-TP	1.89	0.10	mg/kg wet	2.000		94.3	79.1-106			
2,4,5-TP [2C]	1.93	0.10	mg/kg wet	2.000		96.3	68.2-118			
Bentazon	1.03	0.10	mg/kg wet	1.000		103	82.5-119			
Bentazon [2C]	0.898	0.10	mg/kg wet	1.000		89.8	73.3-125			
Dicamba	2.00	0.10	mg/kg wet	2.000		99.9	85.1-108			
Dicamba [2C]	2.03	0.10	mg/kg wet	2.000		101	71.4-115			
Picloram	0.993	0.10	mg/kg wet	1.000		99.3	86.1-106			
Picloram [2C]	0.891	0.10	mg/kg wet	1.000		89.1	74.5-114			
Triclopyr	1.84	0.10	mg/kg wet	2.000		91.8	78.6-106			
Triclopyr [2C]	1.90	0.10	mg/kg wet	2.000		95.1	69.4-118			
Surrogate: DCAA	20.6		mg/kg wet	20.00		103	70.8-116			
Surrogate: DCAA [2C]	19.8		mg/kg wet	20.00		98.8	62.3-114			

LCS (A804197-BS2)		Prepared: 04/26/2018 Analyzed: 04/27/2018 00:39								
MCPA	2.14	0.10	mg/kg wet	2.000		107	79.4-116			
MCPA [2C]	2.26	0.10	mg/kg wet	2.000		113	77-123			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428176
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

LCS (A804197-BS2)

Prepared: 04/26/2018 Analyzed: 04/27/2018 00:39

Surrogate: DCAA	21.0		mg/kg wet	20.00		105	70.8-116			
Surrogate: DCAA [2C]	22.4		mg/kg wet	20.00		112	62.3-114			

Matrix Spike (A804197-MS1)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 17:33

2,4-D	2.39	0.10	mg/kg dry	2.682	ND	89.2	71.4-105			
2,4-D [2C]	2.16	0.10	mg/kg dry	2.682	0.0340	79.1	50.5-123			
2,4-DB	2.20	0.10	mg/kg dry	2.682	ND	82.2	46.4-117			
2,4-DB [2C]	2.12	0.10	mg/kg dry	2.682	0.0486	77.3	44.5-121			
2,4,5-T	2.46	0.10	mg/kg dry	2.682	0.0528	89.8	66.2-110			
2,4,5-T [2C]	2.28	0.10	mg/kg dry	2.682	ND	85.0	43.6-126			
2,4,5-TP	2.37	0.10	mg/kg dry	2.682	ND	88.5	52.4-114			
2,4,5-TP [2C]	2.21	0.10	mg/kg dry	2.682	0.0443	80.7	47.6-117			
Bentazon	1.25	0.10	mg/kg dry	1.341	0.0694	88.0	61.5-117			
Bentazon [2C]	0.896	0.10	mg/kg dry	1.341	0.0365	64.1	50.7-127			
Dicamba	2.06	0.10	mg/kg dry	2.682	ND	76.6	48.4-111			
Dicamba [2C]	1.95	0.10	mg/kg dry	2.682	0.0300	71.6	43.3-108			
Picloram	0.852	0.10	mg/kg dry	1.341	ND	63.5	26.7-110			
Picloram [2C]	0.565	0.10	mg/kg dry	1.341	0.00941	41.4	10.8-110			
Triclopyr	2.34	0.10	mg/kg dry	2.682	ND	87.2	56-113			
Triclopyr [2C]	2.29	0.10	mg/kg dry	2.682	0.0413	83.7	47.9-120			
Surrogate: DCAA	25.5		mg/kg dry	26.82		95.0	70.8-116			
Surrogate: DCAA [2C]	21.9		mg/kg dry	26.82		81.8	62.3-114			

Matrix Spike (A804197-MS2)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 19:47

MCPA	2.69	0.10	mg/kg dry	2.682	ND	100	74.2-114			
MCPA [2C]	2.57	0.10	mg/kg dry	2.682	0.0400	94.5	60.9-122			
Surrogate: DCAA	26.5		mg/kg dry	26.82		98.8	70.8-116			
Surrogate: DCAA [2C]	26.3		mg/kg dry	26.82		98.2	62.3-114			

Matrix Spike Dup (A804197-MSD1)

Source: A181702-02

Prepared: 04/26/2018 Analyzed: 05/01/2018 18:40

2,4-D	2.40	0.10	mg/kg dry	2.682	ND	89.3	71.4-105	0.174	20	
2,4-D [2C]	2.16	0.10	mg/kg dry	2.682	0.0340	79.1	50.5-123	0.0217	20	
2,4-DB	2.19	0.10	mg/kg dry	2.682	ND	81.5	46.4-117	0.805	20	
2,4-DB [2C]	2.14	0.10	mg/kg dry	2.682	0.0486	78.0	44.5-121	0.882	20	
2,4,5-T	2.44	0.10	mg/kg dry	2.682	0.0528	89.0	66.2-110	0.921	20	
2,4,5-T [2C]	2.28	0.10	mg/kg dry	2.682	ND	85.1	43.6-126	0.192	20	
2,4,5-TP	2.40	0.10	mg/kg dry	2.682	ND	89.4	52.4-114	1.02	20	
2,4,5-TP [2C]	2.17	0.10	mg/kg dry	2.682	0.0443	79.3	47.6-117	1.71	20	
Bentazon	1.39	0.10	mg/kg dry	1.341	0.0694	98.4	61.5-117	10.6	20	
Bentazon [2C]	1.03	0.10	mg/kg dry	1.341	0.0365	74.2	50.7-127	14.1	20	
Dicamba	2.18	0.10	mg/kg dry	2.682	ND	81.4	48.4-111	6.02	20	
Dicamba [2C]	2.12	0.10	mg/kg dry	2.682	0.0300	77.9	43.3-108	8.30	20	
Picloram	0.927	0.10	mg/kg dry	1.341	ND	69.1	26.7-110	8.41	20	
Picloram [2C]	0.611	0.10	mg/kg dry	1.341	0.00941	44.9	10.8-110	7.94	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Solid - MN
 Project Number: 10428176
 Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804197 - EPA 3570

Matrix Spike Dup (A804197-MSD1)		Source: A181702-02			Prepared: 04/26/2018 Analyzed: 05/01/2018 18:40					
Triclopyr	2.32	0.10	mg/kg dry	2.682	ND	86.3	56-113	1.05	20	
Triclopyr [2C]	2.16	0.10	mg/kg dry	2.682	0.0413	78.9	47.9-120	5.78	20	
Surrogate: DCAA	26.2		mg/kg dry	26.82		97.8	70.8-116			
Surrogate: DCAA [2C]	23.6		mg/kg dry	26.82		88.1	62.3-114			
Matrix Spike Dup (A804197-MSD2)		Source: A181702-02			Prepared: 04/26/2018 Analyzed: 05/01/2018 20:54					
MCPA	2.68	0.10	mg/kg dry	2.682	ND	99.8	74.2-114	0.430	20	
MCPA [2C]	2.53	0.10	mg/kg dry	2.682	0.0400	92.7	60.9-122	1.83	20	
Surrogate: DCAA	25.9		mg/kg dry	26.82		96.7	70.8-116			
Surrogate: DCAA [2C]	26.3		mg/kg dry	26.82		98.0	62.3-114			



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
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 1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Solid - MN

Project Number: 10428176

Project Manager: Jennifer Anderson

Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804195 - % Solids

Duplicate (A804195-DUP1)

Source: A181708-01

Prepared: 04/25/2018 Analyzed: 04/27/2018 09:07

% Solids	79.2	0.00	% by Weight		79.6			0.516	20	
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2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Solid - MN
Project Number: 10428176
Project Manager: Jennifer Anderson

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

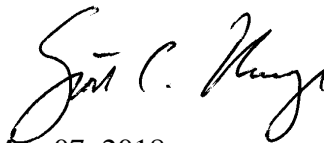
PaceProject#: 10428177
Sample Receipt Date: 04/20/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 07, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

May 7, 2018



DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of Pace Analytical Services, Inc. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using a modified version of USEPA Method 8290. The reporting limits were set to correspond to the lowest calibration points and a nominal 10-gram sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 56%. All of the labeled standard recoveries obtained for this project were within the 40-135% target range specified in Method 8290. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show that 2,3,7,8-TCDD was not detected, indicating that the sample processing steps were free of background levels of this congener.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 118%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10428177

Appendix A

Sample Management

Sample Condition
Upon Receipt

Client Name:

Project #:

MPCA

WO# : 10428177
 PM: SCU Due Date: 05/07/18
 CLIENT: PAST-MINFIELD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.5 Cooler Temp Corrected (°C): 6.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: True Date and Initials of Person Examining Contents: HE 4-20-18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	12. <u>No time on COC or Sample</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # _____ Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>0-2019-3 ME 4/20/18</u>	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Received during cool down phase.

Project Manager Review:

Signatures

Date: 04/24/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10428177

Appendix B

Sample Analysis Summary



Method 8290 Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-08 (1-7WM)		
Lab Sample ID	10428177001		
Filename	U180507A_07		
Injected By	BAL		
Total Amount Extracted	18.8 g	Matrix	Solid
% Moisture	64.0	Dilution	NA
Dry Weight Extracted	6.77 g	Collected	04/20/2018 00:01
ICAL ID	U180405	Received	04/20/2018 17:30
CCal Filename(s)	U180506B_16 & U180507A_16	Extracted	04/26/2018 14:55
Method Blank ID	BLANK-61977	Analyzed	05/07/2018 02:32

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	1.5	----	1.0	2,3,7,8-TCDD-13C	2.00	56
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	59

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.
 R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Blank Analysis Results

Lab Sample ID	BLANK-61977	Matrix	Solid
Filename	U180507A_03	Dilution	NA
Total Amount Extracted	10.1 g	Extracted	04/26/2018 14:55
ICAL ID	U180405	Analyzed	05/06/2018 23:21
CCal Filename(s)	U180506B_16 & U180507A_16	Injected By	BAL

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	48
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	55

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

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Method 8290 Laboratory Control Spike Results

Lab Sample ID	LCS-61978	Matrix	Solid
Filename	U180503B_02	Dilution	NA
Total Amount Extracted	10.4 g	Extracted	04/26/2018 14:55
ICAL ID	U180405	Analyzed	05/03/2018 17:02
CCal Filename(s)	U180503A_13 & U180503B_16	Injected By	SMT
Method Blank ID	BLANK-61977		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	0.20	0.24	118	2,3,7,8-TCDD-13C	2.0	58
				Recovery Standard 1,2,3,4-TCDD-13C	2.0	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	60

Qs = Quantity Spiked
 Qm = Quantity Measured
 Rec. = Recovery (Expressed as Percent)
 R = Recovery outside of target range

Y = RF averaging used in calculations
 Nn = Value obtained from additional analysis
 NA = Not Applicable
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Protecting, maintaining and improving the health of all Minnesotans

Report Date: 5/16/18

Client Name: QU - MPCA - Closed Landfill Assessment 4

Project Code: QU

Project Name: Closed Landfill Assessment 4

Work Order Number: 18D1273

Report To: QU - MPCA - Closed Landfill Assessment 4

Benjamin Klismith

520 Lafayette Rd.

Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink that reads "Paul Moyer".

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300

<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Work Order Comment: Samples were received in proper condition unless otherwise specified in the receiving comments.

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
FL-TT-08	18D1273-01	Non-potable Water	04/20/18 15:00	04/24/18 9:10	5.4

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: APR 24 '18 9:10

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # 7475 9832 2621

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can
 None Other _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No Yes

Packaging, Temperature & Radiochemical Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack #() Gel pack #() Dry ice None
 Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 5.4 °C IR thermometer instrument used: AS

Samples received with evidence of freezing: No; Yes _____

Rad Chem. request received: No; Yes, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Initials of person receiving parcel: W

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No Unknown

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Sample submission details are entered in the Environmental Laboratory LIMS.
Initials of person logging in the work order request into LIMS: W

Final Report
Case Narrative

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name: MN SW-057 / MPCA - Freeway LF
Collected by: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/2018 10:44

Except where noted in this report, no additional comments are needed for this Work Order.

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

MDH Sample Number: 18D1273-01

Location ID: FL-TT-08	Collect Date: 04/20/18	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:00	Field Fluoride Result: None
Sampling Point: FL-TT-08	Matrix: Non-potable Water	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Surrogate: 4-Bromofluorobenzene		101	70-130	%	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,1-Trichloroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,2-Trichloroethane		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1-Dichloroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1-Dichloroethene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,1-Dichloropropene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2,3-Trichloropropane		<	0.20	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dichloroethane		<	0.20	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,2-Dichloropropane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,3-Dichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,3-Dichloropropane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
1,4-Dichlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
2,2-Dichloropropane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B

FINAL REPORT

Report ID: 05162018104423

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

MDH Sample Number: 18D1273-01

Location ID: FL-TT-08	Collect Date: 04/20/18	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:00	Field Fluoride Result: None
Sampling Point: FL-TT-08	Matrix: Non-potable Water	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
4-Chlorotoluene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Acetone		26	20	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Allyl chloride		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Benzene		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromochloromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromodichloromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromoform		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Bromomethane		<	2.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Carbon tetrachloride		<	0.20	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chlorobenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chlorodibromomethane		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chloroethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chloroform		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Chloromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Dibromomethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Dichlorodifluoromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Dichlorofluoromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Ethyl ether		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Ethylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Hexachlorobutadiene		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Isopropylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B

FINAL REPORT

Report ID: 05162018104423

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

MDH Sample Number: 18D1273-01

Location ID: FL-TT-08	Collect Date: 04/20/18	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:00	Field Fluoride Result: None
Sampling Point: FL-TT-08	Matrix: Non-potable Water	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Methylene chloride		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Naphthalene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
n-Butylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
n-Propylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
o-Xylene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
p&m-Xylene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
p-Isopropyltoluene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
sec-Butylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Styrene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
tert-Butylbenzene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Tetrachloroethene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Tetrahydrofuran (THF)		<	10	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Toluene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Trichloroethene (TCE)		<	0.10	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Trichlorofluoromethane		<	1.0	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B
Vinyl chloride		<	0.050	ug/L	1	B8D0371	04/24/18 23:11	04/24/18 23:11	EPA 8260B

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.17	0.048	ug/L	1	B8D0444	04/27/18 08:39	04/30/18 16:10	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555

FINAL REPORT

Report ID: 05162018104423

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

MDH Sample Number: 18D1273-01

Location ID: FL-TT-08	Collect Date: 04/20/18	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:00	Field Fluoride Result: None
Sampling Point: FL-TT-08	Matrix: Non-potable Water	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanoic acid (PFBA)		0.070	0.050	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluorohexanesulfonate (PFHxS)	J	0.019	0.025	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluorohexanoic acid (PFHxA)		0.080	0.050	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluorooctanesulfonate (PFOS)		0.14	0.025	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluorooctanoic acid (PFOA)		0.21	0.035	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555
Perfluoropentanoic acid (PFPeA)		0.070	0.050	ug/L	1	B8D0470	04/27/18 23:08	04/27/18 23:08	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Batch Summary

Samples in Batch: B8D0371 - EPA 5030B Preparation

18D1273-01

Samples in Batch: B8D0444 - 1,4 Dioxane in Water SPE

18D1273-01

Samples in Batch: B8D0470 - PFCs Preparation

18D1273-01

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Blank (B8D0371-BLK1)

Prepared: 04/24/18 17:15 Analyzed: 04/24/18 17:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

FINAL REPORT

Report ID: 05162018104423

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Blank (B8D0371-BLK1)

Prepared: 04/24/18 17:15 Analyzed: 04/24/18 17:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane		<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

FINAL REPORT

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Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Blank (B8D0371-BLK1)

Prepared: 04/24/18 17:15 Analyzed: 04/24/18 17:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B8D0371-BS1)

Prepared: 04/24/18 14:57 Analyzed: 04/24/18 14:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		103	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		104	70-130		
1,1,2,2-Tetrachloroethane		9.7	0.50	ug/L	10		97	70-130		
1,1,2-Trichloroethane		9.2	0.50	ug/L	10		92	70-130		
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		105	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		102	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		104	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		105	70-130		
1,2,3-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,3-Trichloropropane		9.4	0.20	ug/L	10		94	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10		100	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10		101	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		101	70-130		
1,2-Dibromoethane (EDB)		9.9	0.50	ug/L	10		99	70-130		
1,2-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2-Dichloroethane		9.7	0.20	ug/L	10		97	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10		101	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		102	70-130		
1,3-Dichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
1,3-Dichloropropane		9.8	1.0	ug/L	10		98	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10		101	70-130		
2,2-Dichloropropane		10	1.0	ug/L	10		104	70-130		
2-Chlorotoluene		10	1.0	ug/L	10		100	70-130		
4-Chlorotoluene		10	1.0	ug/L	10		101	70-130		
Acetone		86	20	ug/L	100		86	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

LCS (B8D0371-BS1)

Prepared: 04/24/18 14:57 Analyzed: 04/24/18 14:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		9.8	1.0	ug/L	10		98	70-130		
Benzene		10	0.50	ug/L	10		103	70-130		
Bromobenzene		10	1.0	ug/L	10		100	70-130		
Bromochloromethane		9.9	1.0	ug/L	10		99	70-130		
Bromodichloromethane		10	1.0	ug/L	10		103	70-130		
Bromoform		10	1.0	ug/L	10		103	70-130		
Bromomethane		11	2.0	ug/L	10		107	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		105	70-130		
Chlorobenzene		9.9	1.0	ug/L	10		99	70-130		
Chlorodibromomethane		10	0.50	ug/L	10		102	70-130		
Chloroethane		9.7	1.0	ug/L	10		97	70-130		
Chloroform		10	1.0	ug/L	10		101	70-130		
Chloromethane		9.6	1.0	ug/L	10		96	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130		
cis-1,3-Dichloropropene		9.7	0.50	ug/L	10		97	70-130		
Dibromomethane		9.8	1.0	ug/L	10		98	70-130		
Dichlorodifluoromethane		9.5	1.0	ug/L	10		95	70-130		
Dichlorofluoromethane		10	1.0	ug/L	10		102	70-130		
Ethyl ether		9.8	1.0	ug/L	10		98	70-130		
Ethylbenzene		10	1.0	ug/L	10		101	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10		102	70-130		
Isopropylbenzene		10	1.0	ug/L	10		101	70-130		
Methyl ethyl ketone (MEK)		47	10	ug/L	50		95	70-130		
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		100	70-130		
Methylene chloride		10	1.0	ug/L	10		102	70-130		
Naphthalene		10	1.0	ug/L	10		102	70-130		
n-Butylbenzene		10	1.0	ug/L	10		104	70-130		
n-Propylbenzene		10	1.0	ug/L	10		103	70-130		
o-Xylene		10	1.0	ug/L	10		101	70-130		
p&m-Xylene		10	1.0	ug/L	10		102	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10		104	70-130		
sec-Butylbenzene		11	1.0	ug/L	10		106	70-130		
Styrene		10	1.0	ug/L	10		100	70-130		
tert-Butylbenzene		10	1.0	ug/L	10		103	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

LCS (B8D0371-BS1)

Prepared: 04/24/18 14:57 Analyzed: 04/24/18 14:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		102	70-130		
Tetrahydrofuran (THF)		93	10	ug/L	100		93	70-130		
Toluene		9.8	1.0	ug/L	10		98	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		105	70-130		
trans-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		
Trichlorofluoromethane		10	1.0	ug/L	10		100	70-130		
Vinyl chloride		9.8	0.050	ug/L	10		98	70-130		

LCS Dup (B8D0371-BSD1)

Prepared: 04/24/18 15:24 Analyzed: 04/24/18 15:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		103	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130	0.1	30
1,1,1-Trichloroethane		10	1.0	ug/L	10		102	70-130	2	30
1,1,2,2-Tetrachloroethane		9.9	0.50	ug/L	10		99	70-130	2	30
1,1,2-Trichloroethane		9.7	0.50	ug/L	10		97	70-130	5	30
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		103	70-130	2	30
1,1-Dichloroethane		10	1.0	ug/L	10		103	70-130	1	30
1,1-Dichloroethene		10	1.0	ug/L	10		100	70-130	4	30
1,1-Dichloropropene		10	1.0	ug/L	10		104	70-130	1	30
1,2,3-Trichlorobenzene		10	1.0	ug/L	10		100	70-130	2	30
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130	2	30
1,2,4-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130	1	30
1,2,4-Trimethylbenzene		10	1.0	ug/L	10		101	70-130	0	30
1,2-Dibromo-3-chloropropane (DBCP)		9.7	1.0	ug/L	10		97	70-130	4	30
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		100	70-130	1	30
1,2-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	0.1	30
1,2-Dichloroethane		9.8	0.20	ug/L	10		98	70-130	1	30
1,2-Dichloropropane		10	1.0	ug/L	10		102	70-130	1	30
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		100	70-130	2	30
1,3-Dichlorobenzene		10	1.0	ug/L	10		100	70-130	0.8	30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

LCS Dup (B8D0371-BSD1)

Prepared: 04/24/18 15:24 Analyzed: 04/24/18 15:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		9.9	1.0	ug/L	10		99	70-130	0.9	30
1,4-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	3	30
2,2-Dichloropropane		10	1.0	ug/L	10		102	70-130	3	30
2-Chlorotoluene		10	1.0	ug/L	10		100	70-130	0.2	30
4-Chlorotoluene		10	1.0	ug/L	10		100	70-130	0.5	30
Acetone		90	20	ug/L	100		90	70-130	5	30
Allyl chloride		10	1.0	ug/L	10		102	70-130	4	30
Benzene		10	0.50	ug/L	10		103	70-130	0.5	30
Bromobenzene		9.9	1.0	ug/L	10		99	70-130	0.4	30
Bromochloromethane		10	1.0	ug/L	10		101	70-130	2	30
Bromodichloromethane		10	1.0	ug/L	10		102	70-130	1	30
Bromoform		9.8	1.0	ug/L	10		98	70-130	5	30
Bromomethane		11	2.0	ug/L	10		107	70-130	0.5	30
Carbon tetrachloride		10	0.20	ug/L	10		104	70-130	2	30
Chlorobenzene		10	1.0	ug/L	10		100	70-130	0.9	30
Chlorodibromomethane		10	0.50	ug/L	10		100	70-130	2	30
Chloroethane		9.7	1.0	ug/L	10		97	70-130	0	30
Chloroform		10	1.0	ug/L	10		101	70-130	0.1	30
Chloromethane		9.5	1.0	ug/L	10		95	70-130	1	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130	0.1	30
cis-1,3-Dichloropropene		9.6	0.50	ug/L	10		96	70-130	0.6	30
Dibromomethane		10	1.0	ug/L	10		100	70-130	2	30
Dichlorodifluoromethane		9.4	1.0	ug/L	10		94	70-130	0.5	30
Dichlorofluoromethane		10	1.0	ug/L	10		102	70-130	0.4	30
Ethyl ether		10	1.0	ug/L	10		101	70-130	3	30
Ethylbenzene		10	1.0	ug/L	10		100	70-130	1	30
Hexachlorobutadiene		10	0.50	ug/L	10		100	70-130	3	30
Isopropylbenzene		10	1.0	ug/L	10		101	70-130	0.5	30
Methyl ethyl ketone (MEK)		49	10	ug/L	50		97	70-130	2	30
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50		101	70-130	2	30
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		101	70-130	1	30
Methylene chloride		10	1.0	ug/L	10		104	70-130	2	30
Naphthalene		10	1.0	ug/L	10		101	70-130	0.8	30
n-Butylbenzene		10	1.0	ug/L	10		103	70-130	1	30
n-Propylbenzene		10	1.0	ug/L	10		102	70-130	1	30

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

LCS Dup (B8D0371-BSD1)

Prepared: 04/24/18 15:24 Analyzed: 04/24/18 15:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		9.9	1.0	ug/L	10		99	70-130	2	30
p&m-Xylene		10	1.0	ug/L	10		103	70-130	1	30
p-Isopropyltoluene		10	1.0	ug/L	10		103	70-130	1	30
sec-Butylbenzene		10	1.0	ug/L	10		104	70-130	2	30
Styrene		10	1.0	ug/L	10		101	70-130	1	30
tert-Butylbenzene		10	1.0	ug/L	10		100	70-130	3	30
Tetrachloroethene		10	1.0	ug/L	10		102	70-130	0.3	30
Tetrahydrofuran (THF)		94	10	ug/L	100		94	70-130	1	30
Toluene		9.9	1.0	ug/L	10		99	70-130	0.8	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130	3	30
trans-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130	0.2	30
Trichloroethene (TCE)		10	0.10	ug/L	10		100	70-130	0.7	30
Trichlorofluoromethane		9.8	1.0	ug/L	10		98	70-130	1	30
Vinyl chloride		9.7	0.050	ug/L	10		97	70-130	1	30

Duplicate (B8D0371-DUP1)

Source: 18D0792-01

Prepared: 04/24/18 19:04 Analyzed: 04/24/18 19:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4	F4	100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene	F4	102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3	F4	100	70-130	%	10					
1,1,1,2-Tetrachloroethane	F4	<	1.0	ug/L		<				30
1,1,1-Trichloroethane	F4	<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane	F4	<	0.50	ug/L		<				30
1,1,2-Trichloroethane	F4	<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane	F4	<	1.0	ug/L		<				30
1,1-Dichloroethane	F4	<	1.0	ug/L		<				30
1,1-Dichloroethene	F4	<	1.0	ug/L		<				30
1,1-Dichloropropene	F4	<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene	F4	<	1.0	ug/L		<				30
1,2,3-Trichloropropane	F4	<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene	F4	<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene	F4	6.2	1.0	ug/L		5.7			8	30
1,2-Dibromo-3-chloropropane (DBCP)	F4	<	1.0	ug/L		<				30

FINAL REPORT

Report ID: 05162018104423

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Duplicate (B8D0371-DUP1)

Source: 18D0792-01

Prepared: 04/24/18 19:04 Analyzed: 04/24/18 19:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)	F4	<	0.50	ug/L	<	<				30
1,2-Dichlorobenzene	F4	<	1.0	ug/L	<	<				30
1,2-Dichloroethane	F4	<	0.20	ug/L	<	<				30
1,2-Dichloropropane	F4	0.22	1.0	ug/L	<	<				30
1,3,5-Trimethylbenzene	F4	1.6	1.0	ug/L		1.6			5	30
1,3-Dichlorobenzene	F4	<	1.0	ug/L	<	<				30
1,3-Dichloropropane	F4	<	1.0	ug/L	<	<				30
1,4-Dichlorobenzene	F4	<	1.0	ug/L	<	<				30
2,2-Dichloropropane	F4	<	1.0	ug/L	<	<				30
2-Chlorotoluene	F4	<	1.0	ug/L	<	<				30
4-Chlorotoluene	F4	<	1.0	ug/L	<	<				30
Acetone	F4	18	20	ug/L	<	<			5	30
Allyl chloride	F4	<	1.0	ug/L	<	<				30
Benzene	F4	1.6	0.50	ug/L		1.4			11	30
Bromobenzene	F4	<	1.0	ug/L	<	<				30
Bromochloromethane	F4	<	1.0	ug/L	<	<				30
Bromodichloromethane	F4	<	1.0	ug/L	<	<				30
Bromoform	F4	<	1.0	ug/L	<	<				30
Bromomethane	F4	<	2.0	ug/L	<	<				30
Carbon tetrachloride	F4	<	0.20	ug/L	<	<				30
Chlorobenzene	F4	<	1.0	ug/L	<	<				30
Chlorodibromomethane	F4	<	0.50	ug/L	<	<				30
Chloroethane	F4	0.23	1.0	ug/L	<	<				30
Chloroform	F4	<	1.0	ug/L	<	<				30
Chloromethane	F4	<	1.0	ug/L	<	<				30
cis-1,2-Dichloroethene	F4	1.7	1.0	ug/L		1.6			7	30
cis-1,3-Dichloropropene	F4	<	0.50	ug/L	<	<				30
Dibromomethane	F4	<	1.0	ug/L	<	<				30
Dichlorodifluoromethane	F4	<	1.0	ug/L	<	<				30
Dichlorofluoromethane	F4	<	1.0	ug/L	<	<				30
Ethyl ether	F4	9.4	1.0	ug/L		8.6			8	30
Ethylbenzene	F4	2.2	1.0	ug/L		2.2			1	30
Hexachlorobutadiene	F4	<	0.50	ug/L	<	<				30
Isopropylbenzene	F4	0.80	1.0	ug/L	<	<			6	30
Methyl ethyl ketone (MEK)	F4	13	10	ug/L		13			1	30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Duplicate (B8D0371-DUP1)		Source: 18D0792-01		Prepared: 04/24/18 19:04 Analyzed: 04/24/18 19:04						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)	F4	2.3	5.0	ug/L		<			3	30
Methyl tertiary butyl ether (MTBE)	F4	0.91	2.0	ug/L		<			6	30
Methylene chloride	F4	0.56	1.0	ug/L		<			7	30
Naphthalene	F4	2.2	1.0	ug/L		2.1			1	30
n-Butylbenzene	F4	<	1.0	ug/L		<				30
n-Propylbenzene	F4	0.89	1.0	ug/L		<			7	30
o-Xylene	F4	1.8	1.0	ug/L		1.7			3	30
p&m-Xylene	F4	5.1	1.0	ug/L		5.0			0.8	30
p-Isopropyltoluene	F4	2.4	1.0	ug/L		2.2			7	30
sec-Butylbenzene	F4	<	1.0	ug/L		<				30
Styrene	F4	<	1.0	ug/L		<				30
tert-Butylbenzene	F4	<	1.0	ug/L		<				30
Tetrachloroethene	F4	<	1.0	ug/L		<				30
Tetrahydrofuran (THF)	F4	26	10	ug/L		25			5	30
Toluene	F4	2.8	1.0	ug/L		2.8			2	30
trans-1,2-Dichloroethene	F4	<	1.0	ug/L		<				30
trans-1,3-Dichloropropene	F4	<	0.50	ug/L		<				30
Trichloroethene (TCE)	F4	0.080	0.10	ug/L		<			0	30
Trichlorofluoromethane	F4	<	1.0	ug/L		<				30
Vinyl chloride	F4	<	0.050	ug/L		<				30

Matrix Spike (B8D0371-MS1)		Source: 18D0790-01		Prepared: 04/24/18 15:52 Analyzed: 04/24/18 15:52						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		103	70-130	%	10					
1,1,1,2-Tetrachloroethane		7.9	1.0	ug/L	10	<	79	70-130		
1,1,1-Trichloroethane		8.1	1.0	ug/L	10	<	81	70-130		
1,1,2,2-Tetrachloroethane		7.9	0.50	ug/L	10	<	79	70-130		
1,1,2-Trichloroethane		7.5	0.50	ug/L	10	<	75	70-130		
1,1,2-Trichlorotrifluoroethane		8.5	1.0	ug/L	10	<	85	70-130		
1,1-Dichloroethane		8.2	1.0	ug/L	10	<	82	70-130		
1,1-Dichloroethene		8.5	1.0	ug/L	10	<	85	70-130		
1,1-Dichloropropene		8.6	1.0	ug/L	10	<	86	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Matrix Spike (B8D0371-MS1)		Source: 18D0790-01		Prepared: 04/24/18 15:52 Analyzed: 04/24/18 15:52						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		7.8	1.0	ug/L	10	<	78	70-130		
1,2,3-Trichloropropane		8.1	0.20	ug/L	10	<	81	70-130		
1,2,4-Trichlorobenzene		7.6	1.0	ug/L	10	<	76	70-130		
1,2,4-Trimethylbenzene		7.9	1.0	ug/L	10	<	79	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.7	1.0	ug/L	10	<	97	70-130		
1,2-Dibromoethane (EDB)		7.7	0.50	ug/L	10	<	77	70-130		
1,2-Dichlorobenzene		7.7	1.0	ug/L	10	<	77	70-130		
1,2-Dichloroethane		7.5	0.20	ug/L	10	<	75	70-130		
1,2-Dichloropropane		7.6	1.0	ug/L	10	<	76	70-130		
1,3,5-Trimethylbenzene		8.1	1.0	ug/L	10	<	81	70-130		
1,3-Dichlorobenzene		7.6	1.0	ug/L	10	<	76	70-130		
1,3-Dichloropropane		7.6	1.0	ug/L	10	<	76	70-130		
1,4-Dichlorobenzene		7.8	1.0	ug/L	10	<	78	70-130		
2,2-Dichloropropane		8.3	1.0	ug/L	10	<	83	70-130		
2-Chlorotoluene		7.9	1.0	ug/L	10	<	79	70-130		
4-Chlorotoluene		7.9	1.0	ug/L	10	<	79	70-130		
Acetone		98	20	ug/L	100	<	94	70-130		
Allyl chloride		8.0	1.0	ug/L	10	<	80	70-130		
Benzene		10	0.50	ug/L	10	2.7	77	70-130		
Bromobenzene		7.5	1.0	ug/L	10	<	75	70-130		
Bromochloromethane		7.6	1.0	ug/L	10	<	76	70-130		
Bromodichloromethane		7.7	1.0	ug/L	10	<	77	70-130		
Bromoform		8.2	1.0	ug/L	10	<	82	70-130		
Bromomethane		8.4	2.0	ug/L	10	<	84	70-130		
Carbon tetrachloride		8.3	0.20	ug/L	10	<	83	70-130		
Chlorobenzene		10	1.0	ug/L	10	2.1	78	70-130		
Chlorodibromomethane		7.8	0.50	ug/L	10	<	78	70-130		
Chloroethane		8.3	1.0	ug/L	10	1.1	71	70-130		
Chloroform		7.8	1.0	ug/L	10	<	78	70-130		
Chloromethane		7.6	1.0	ug/L	10	<	76	70-130		
cis-1,2-Dichloroethene		7.8	1.0	ug/L	10	<	78	70-130		
cis-1,3-Dichloropropene		7.4	0.50	ug/L	10	<	74	70-130		
Dibromomethane		7.3	1.0	ug/L	10	<	73	70-130		
Dichlorodifluoromethane		7.7	1.0	ug/L	10	<	77	70-130		
Dichlorofluoromethane		8.1	1.0	ug/L	10	<	81	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0371 - EPA 5030B Preparation

Analyte	Analyte Qualifier(s)	Source: 18D0790-01		Prepared: 04/24/18 15:52 Analyzed: 04/24/18 15:52						
		Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ethyl ether		8.4	1.0	ug/L	10	1.1	73	70-130		
Ethylbenzene		8.1	1.0	ug/L	10	<	81	70-130		
Hexachlorobutadiene		8.2	0.50	ug/L	10	<	82	70-130		
Isopropylbenzene		8.3	1.0	ug/L	10	<	83	70-130		
Methyl ethyl ketone (MEK)		52	10	ug/L	50	<	103	70-130		
Methyl isobutyl ketone (MIBK)		49	5.0	ug/L	50	<	97	70-130		
Methyl tertiary butyl ether (MTBE)		7.5	2.0	ug/L	10	<	75	70-130		
Methylene chloride		7.7	1.0	ug/L	10	<	77	70-130		
Naphthalene		8.3	1.0	ug/L	10	<	83	70-130		
n-Butylbenzene		8.4	1.0	ug/L	10	<	84	70-130		
n-Propylbenzene		8.3	1.0	ug/L	10	<	83	70-130		
o-Xylene		8.0	1.0	ug/L	10	<	80	70-130		
p&m-Xylene		8.3	1.0	ug/L	10	<	83	70-130		
p-Isopropyltoluene		8.5	1.0	ug/L	10	<	85	70-130		
sec-Butylbenzene		8.4	1.0	ug/L	10	<	84	70-130		
Styrene		7.6	1.0	ug/L	10	<	76	70-130		
tert-Butylbenzene		8.2	1.0	ug/L	10	<	82	70-130		
Tetrachloroethene		8.2	1.0	ug/L	10	<	82	70-130		
Tetrahydrofuran (THF)		99	10	ug/L	100	<	96	70-130		
Toluene		8.0	1.0	ug/L	10	<	80	70-130		
trans-1,2-Dichloroethene		8.1	1.0	ug/L	10	<	81	70-130		
trans-1,3-Dichloropropene		7.6	0.50	ug/L	10	<	76	70-130		
Trichloroethene (TCE)		8.1	0.10	ug/L	10	0.15	79	70-130		
Trichlorofluoromethane		8.0	1.0	ug/L	10	<	80	70-130		
Vinyl chloride		8.0	0.050	ug/L	10	0.10	78	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0444 - 1,4 Dioxane in Water SPE

Blank (B8D0444-BLK1)

Prepared: 04/27/18 08:39 Analyzed: 04/30/18 10:53

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L						

LCS (B8D0444-BS1)

Prepared: 04/27/18 08:39 Analyzed: 04/30/18 11:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.21	0.050	ug/L	0.19		107	80-120		

Duplicate (B8D0444-DUP1)

Source: 18D0790-01

Prepared: 04/27/18 08:39 Analyzed: 04/30/18 11:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		8.6	0.049	ug/L		8.4			3	30

Matrix Spike (B8D0444-MS1)

Source: 18D0790-02

Prepared: 04/27/18 08:39 Analyzed: 04/30/18 11:24


Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	M1	3.2	0.052	ug/L	0.46	2.2	216	70-130		

FINAL REPORT

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Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Blank (B8D0470-BLK1)

Prepared: 04/27/18 18:26 Analyzed: 04/27/18 18:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B8D0470-BLK2)

Prepared: 04/28/18 00:29 Analyzed: 04/28/18 00:29

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B8D0470-BS1)

Prepared: 04/27/18 18:18 Analyzed: 04/27/18 18:18

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		101	80-120		
Perfluorobutanoic acid (PFBA)		0.48	0.050	ug/L	0.5		95	80-120		
Perfluorohexanesulfonate (PFHxS)		0.48	0.025	ug/L	0.50		95	80-120		
Perfluorohexanoic acid (PFHxA)		0.46	0.050	ug/L	0.5		91	80-120		
Perfluorooctanesulfonate (PFOS)		0.47	0.025	ug/L	0.49		95	80-120		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5		99	80-120		
Perfluoropentanoic acid (PFPeA)		0.46	0.050	ug/L	0.5		92	80-120		

LCS Dup (B8D0470-BSD1)

Prepared: 04/28/18 00:21 Analyzed: 04/28/18 00:21

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50		96	80-120	5	20
Perfluorobutanoic acid (PFBA)		0.48	0.050	ug/L	0.5		96	80-120	0.9	20
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50		92	80-120	3	20

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Final Report
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Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

LCS Dup (B8D0470-BSD1)

Prepared: 04/28/18 00:21 Analyzed: 04/28/18 00:21

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5		96	80-120	5	20
Perfluorooctanesulfonate (PFOS)		0.45	0.025	ug/L	0.49		90	80-120	5	20
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5		95	80-120	4	20
Perfluoropentanoic acid (PFPeA)		0.46	0.050	ug/L	0.5		92	80-120	0.3	20

Duplicate (B8D0470-DUP1)

Source: 18D0967-01

Prepared: 04/27/18 18:51 Analyzed: 04/27/18 18:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L		<				20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L		<				20
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L		<				20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B8D0470-MS1)

Source: 18D0967-01

Prepared: 04/27/18 18:42 Analyzed: 04/27/18 18:42

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.47	0.050	ug/L	0.50	<	93	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	91	70-130		
Perfluorohexanoic acid (PFHxA)		0.44	0.050	ug/L	0.5	<	89	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike (B8D0470-MS2)

Source: 18D0967-02

Prepared: 04/27/18 19:15 Analyzed: 04/27/18 19:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	96	70-130		
Perfluorobutanoic acid (PFBA)		0.72	0.050	ug/L	0.5	0.22	98	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	98	70-130		
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	94	70-130		
Perfluorooctanesulfonate (PFOS)		0.46	0.025	ug/L	0.49	<	92	70-130		
Perfluorooctanoic acid (PFOA)		0.48	0.035	ug/L	0.5	<	97	70-130		

FINAL REPORT

Report ID: 05162018104423

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MS2) Source: 18D0967-02 Prepared: 04/27/18 19:15 Analyzed: 04/27/18 19:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.48	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike (B8D0470-MS3) Source: 18D0792-01 Prepared: 04/27/18 19:31 Analyzed: 04/27/18 19:31

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	96	70-130		
Perfluorobutanoic acid (PFBA)		0.85	0.050	ug/L	0.5	0.38	94	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	0.085	91	70-130		
Perfluorohexanoic acid (PFHxA)		0.58	0.050	ug/L	0.5	0.12	92	70-130		
Perfluorooctanesulfonate (PFOS)		0.78	0.025	ug/L	0.49	0.30	95	70-130		
Perfluorooctanoic acid (PFOA)		0.81	0.035	ug/L	0.5	0.35	92	70-130		
Perfluoropentanoic acid (PFPeA)		0.58	0.050	ug/L	0.5	0.12	92	70-130		

Matrix Spike (B8D0470-MS4) Source: 18D0792-02 Prepared: 04/27/18 19:47 Analyzed: 04/27/18 19:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	94	70-130		
Perfluorobutanoic acid (PFBA)		0.75	0.050	ug/L	0.5	0.27	96	70-130		
Perfluorohexanesulfonate (PFHxS)		0.60	0.025	ug/L	0.50	0.12	97	70-130		
Perfluorohexanoic acid (PFHxA)		0.56	0.050	ug/L	0.5	0.12	88	70-130		
Perfluorooctanesulfonate (PFOS)		1.0	0.025	ug/L	0.49	0.50	101	70-130		
Perfluorooctanoic acid (PFOA)		0.72	0.035	ug/L	0.5	0.24	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	0.076	95	70-130		

Matrix Spike (B8D0470-MS5) Source: 18D0792-03 Prepared: 04/27/18 20:03 Analyzed: 04/27/18 20:03

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	98	70-130		
Perfluorobutanoic acid (PFBA)		2.1	0.050	ug/L	0.5	1.6	89	70-130		
Perfluorohexanesulfonate (PFHxS)		2.5	0.025	ug/L	0.50	1.9	105	70-130		
Perfluorohexanoic acid (PFHxA)		1.2	0.050	ug/L	0.5	0.66	108	70-130		
Perfluorooctanesulfonate (PFOS)		0.79	0.025	ug/L	0.49	0.33	91	70-130		
Perfluorooctanoic acid (PFOA)		2.1	0.035	ug/L	0.5	1.6	115	70-130		
Perfluoropentanoic acid (PFPeA)		0.71	0.050	ug/L	0.5	0.24	94	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MS6) Source: 18D0864-01 Prepared: 04/27/18 20:19 Analyzed: 04/27/18 20:19

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.47	0.050	ug/L	0.50	<	93	70-130		
Perfluorobutanoic acid (PFBA)		0.48	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	99	70-130		
Perfluorohexanoic acid (PFHxA)		0.44	0.050	ug/L	0.5	<	89	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.45	0.035	ug/L	0.5	<	90	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	95	70-130		

Matrix Spike (B8D0470-MS7) Source: 18D0864-02 Prepared: 04/27/18 20:35 Analyzed: 04/27/18 20:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.45	0.050	ug/L	0.50	<	89	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.47	0.025	ug/L	0.50	<	94	70-130		
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	91	70-130		
Perfluorooctanesulfonate (PFOS)		0.46	0.025	ug/L	0.49	<	91	70-130		
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.48	0.050	ug/L	0.5	<	93	70-130		

Matrix Spike (B8D0470-MS8) Source: 18D0864-03 Prepared: 04/27/18 20:51 Analyzed: 04/27/18 20:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	98	70-130		
Perfluorobutanoic acid (PFBA)		0.61	0.050	ug/L	0.5	0.15	93	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	92	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	91	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	0.037	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	0.076	94	70-130		

Matrix Spike (B8D0470-MS9) Source: 18D0864-04 Prepared: 04/27/18 21:07 Analyzed: 04/27/18 21:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	99	70-130		

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MS9) Source: 18D0864-04 Prepared: 04/27/18 21:07 Analyzed: 04/27/18 21:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	90	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	91	70-130		

Matrix Spike (B8D0470-MSA) Source: 18D0864-05 Prepared: 04/27/18 21:24 Analyzed: 04/27/18 21:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.47	0.050	ug/L	0.50	<	94	70-130		
Perfluorobutanoic acid (PFBA)		0.48	0.050	ug/L	0.5	<	96	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	92	70-130		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.45	0.025	ug/L	0.49	<	90	70-130		
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.46	0.050	ug/L	0.5	<	93	70-130		

Matrix Spike (B8D0470-MSB) Source: 18D1030-01 Prepared: 04/27/18 21:40 Analyzed: 04/27/18 21:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	96	70-130		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5	<	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	89	70-130		
Perfluorohexanoic acid (PFHxA)		0.46	0.050	ug/L	0.5	<	89	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	0.051	99	70-130		
Perfluorooctanoic acid (PFOA)		0.62	0.035	ug/L	0.5	0.12	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	95	70-130		

Matrix Spike (B8D0470-MSC) Source: 18D1031-01 Prepared: 04/27/18 21:56 Analyzed: 04/27/18 21:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	91	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	94	70-130		
Perfluorohexanesulfonate (PFHxS)		0.47	0.025	ug/L	0.50	<	94	70-130		
Perfluorohexanoic acid (PFHxA)		0.45	0.050	ug/L	0.5	<	91	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	0.041	95	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	96	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MSC) Source: 18D1031-01 Prepared: 04/27/18 21:56 Analyzed: 04/27/18 21:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	93	70-130		

Matrix Spike (B8D0470-MSD) Source: 18D1272-01 Prepared: 04/27/18 22:12 Analyzed: 04/27/18 22:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.47	0.050	ug/L	0.50	<	93	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	99	70-130		
Perfluorohexanoic acid (PFHxA)		0.44	0.050	ug/L	0.5	<	88	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	0.041	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike Dup (B8D0470-MSD1) Source: 18D0967-01 Prepared: 04/27/18 18:59 Analyzed: 04/27/18 18:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	98	70-130	5	20
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5	<	97	70-130	2	20
Perfluorohexanesulfonate (PFHxS)		0.47	0.025	ug/L	0.50	<	95	70-130	4	20
Perfluorohexanoic acid (PFHxA)		0.46	0.050	ug/L	0.5	<	92	70-130	4	20
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	96	70-130	1	20
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	97	70-130	1	20
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	95	70-130	0.8	20

Matrix Spike (B8D0470-MSE) Source: 18D1272-02 Prepared: 04/27/18 22:28 Analyzed: 04/27/18 22:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	95	70-130		
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5	<	96	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	91	70-130		
Perfluorooctanesulfonate (PFOS)		0.59	0.025	ug/L	0.49	0.14	90	70-130		
Perfluorooctanoic acid (PFOA)		0.67	0.035	ug/L	0.5	0.22	91	70-130		
Perfluoropentanoic acid (PFPeA)		0.48	0.050	ug/L	0.5	<	94	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MSF) Source: 18D1272-03 Prepared: 04/27/18 22:44 Analyzed: 04/27/18 22:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	95	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.48	0.025	ug/L	0.50	<	96	70-130		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	96	70-130		
Perfluorooctanesulfonate (PFOS)		0.57	0.025	ug/L	0.49	0.12	90	70-130		
Perfluorooctanoic acid (PFOA)		0.63	0.035	ug/L	0.5	0.15	95	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike (B8D0470-MSG) Source: 18D1272-04 Prepared: 04/27/18 23:00 Analyzed: 04/27/18 23:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	97	70-130		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5	<	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.46	0.025	ug/L	0.50	<	93	70-130		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	92	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	0.048	94	70-130		
Perfluorooctanoic acid (PFOA)		0.77	0.035	ug/L	0.5	0.27	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.48	0.050	ug/L	0.5	<	94	70-130		

Matrix Spike (B8D0470-MSH) Source: 18D1273-01 Prepared: 04/27/18 23:16 Analyzed: 04/27/18 23:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	99	70-130		
Perfluorobutanoic acid (PFBA)		0.55	0.050	ug/L	0.5	0.070	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.47	0.025	ug/L	0.50	<	91	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	0.080	87	70-130		
Perfluorooctanesulfonate (PFOS)		0.64	0.025	ug/L	0.49	0.14	98	70-130		
Perfluorooctanoic acid (PFOA)		0.69	0.035	ug/L	0.5	0.21	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	0.070	93	70-130		

Matrix Spike (B8D0470-MSI) Source: 18D1440-01 Prepared: 04/27/18 23:32 Analyzed: 04/27/18 23:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	94	70-130		
Perfluorobutanoic acid (PFBA)		0.66	0.050	ug/L	0.5	0.19	95	70-130		
Perfluorohexanesulfonate (PFHxS)		0.57	0.025	ug/L	0.50	0.082	98	70-130		

FINAL REPORT

Report ID: 05162018104423

Authorized by:

The results in this report apply only to the samples analyzed.
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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QU	Project ID: PRJ07786
Program Name: Closed Landfill Assessment 4	Facility Name/ID: MN SW-057 / MPCA - Freeway LF
Collected By: Jack Kokkinen Zack Eckstrom	City: None
Collector ID: None	Generated: 05/16/18 10:44

Results were produced by Minnesota Department of Health, except where noted.

Batch B8D0470 - PFCs Preparation

Matrix Spike (B8D0470-MSI) Source: 18D1440-01 Prepared: 04/27/18 23:32 Analyzed: 04/27/18 23:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	0.068	86	70-130		
Perfluorooctanesulfonate (PFOS)		0.49	0.025	ug/L	0.49	<	94	70-130		
Perfluorooctanoic acid (PFOA)		0.56	0.035	ug/L	0.5	0.074	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	96	70-130		

Matrix Spike (B8D0470-MSJ) Source: 18D1440-02 Prepared: 04/27/18 23:49 Analyzed: 04/27/18 23:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	93	70-130		
Perfluorobutanoic acid (PFBA)		1.1	0.050	ug/L	0.5	0.66	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	0.035	95	70-130		
Perfluorohexanoic acid (PFHxA)		0.63	0.050	ug/L	0.5	0.16	93	70-130		
Perfluorooctanesulfonate (PFOS)		0.46	0.025	ug/L	0.49	<	93	70-130		
Perfluorooctanoic acid (PFOA)		0.59	0.035	ug/L	0.5	0.11	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	0.066	95	70-130		

Matrix Spike (B8D0470-MSK) Source: 18D1440-03 Prepared: 04/28/18 00:05 Analyzed: 04/28/18 00:05

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	97	70-130		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	98	70-130		
Perfluorohexanoic acid (PFHxA)		0.46	0.050	ug/L	0.5	<	92	70-130		
Perfluorooctanesulfonate (PFOS)		0.47	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.47	0.050	ug/L	0.5	<	94	70-130		

FINAL REPORT

Report ID: 05162018104423

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

M1	Matrix spike and/or matrix spike duplicate recovery was high; the associated laboratory control sample and/or laboratory control sample duplicate recovery was acceptable.
J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
F4	The sample pH was greater than 2. Sample was analyzed within 14 days of sampling, but beyond the 7 days recommended for aromatics.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

April 10, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 21, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Pennsylvania Certification IDs

Pennsylvania/TNI Certification #: 65-00282	Vermont Dept. of Health: ID# VT-0282
Puerto Rico Certification #: PA01457	Virgin Island/PADEP Certification
Rhode Island Certification #: 65-00282	Virginia/VELAP Certification #: 9526
South Dakota Certification	Washington Certification #: C868
Tennessee Certification #: 02867	West Virginia DEP Certification #: 143
Texas/TNI Certification #: T104704188-17-3	West Virginia DHHR Certification #: 9964C
Utah/TNI Certification #: PA014572017-9	Wisconsin Approve List for Rad
USDA Soil Permit #: P330-17-00091	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268	Ohio VAP Certification #: CL-0065
Illinois Certification #: 200074	Oklahoma Certification #: 2017-124
Indiana Certification #: C-49-06	Texas Certification #: T104704355-18-12
Kansas/NELAP Certification #:E-10177	West Virginia Certification #: 330
Kentucky UST Certification #: 80226	Wisconsin Certification #: 999788130
Kentucky WW Certification #:98019	USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424447001	FD-A5	Water	03/21/18 10:00	03/21/18 18:12
10424447002	FD-B5	Water	03/21/18 13:20	03/21/18 18:12
10424447003	FD-D5	Water	03/21/18 15:45	03/21/18 18:12

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424447001	FD-A5	EPA 547	AC1	1	PASI-O
		EPA 549.2	WFH	1	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	JRH	38	PASI-M
		EPA 524.2	AEZ	4	PASI-M
		EPA 900.0	NJV	2	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	DCL	1	PASI-M
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
SM 4500-CN-E	DCL	1	PASI-M		
SM 4500-P E	DCL	1	PASI-M		
10424447002	FD-B5	EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	JRH	38	PASI-M
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	DCL	1	PASI-M
		EPA 353.2	JFP	3	PASI-M
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
10424447003	FD-D5	EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	JRH	38	PASI-M
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	DCL	1	PASI-M
		EPA 353.2	JFP	3	PASI-M
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5	Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		03/29/18 20:51		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	03/26/18 22:26	03/27/18 15:47	85-00-7	P4
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52		
Monobromoacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	03/28/18 14:30	03/30/18 01:52	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	102	%	70-130	1	03/28/18 14:30	03/30/18 01:52	600-05-5	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/04/18 14:05	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/02/18 16:36	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	309-00-2	
alpha-BHC	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	319-84-6	
beta-BHC	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	319-85-7	
delta-BHC	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	58-89-9	
Chlordane (Technical)	ND	ug/L	10.8	20	03/23/18 10:27	04/03/18 00:12	57-74-9	
alpha-Chlordane	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	5103-71-9	
gamma-Chlordane	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	5103-74-2	
4,4'-DDD	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	72-54-8	
4,4'-DDE	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	72-55-9	
4,4'-DDT	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	50-29-3	
Dieldrin	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	60-57-1	
Endosulfan I	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	959-98-8	
Endosulfan II	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	33213-65-9	
Endosulfan sulfate	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	1031-07-8	
Endrin	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	72-20-8	
Endrin aldehyde	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	7421-93-4	
Endrin ketone	ND	ug/L	2.2	20	03/23/18 10:27	04/03/18 00:12	53494-70-5	
Heptachlor	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	76-44-8	
Heptachlor epoxide	ND	ug/L	1.1	20	03/23/18 10:27	04/03/18 00:12	1024-57-3	
Methoxychlor	ND	ug/L	10.8	20	03/23/18 10:27	04/03/18 00:12	72-43-5	
Toxaphene	ND	ug/L	32.3	20	03/23/18 10:27	04/03/18 00:12	8001-35-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5		Lab ID: 10424447001		Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	62-125	20	03/23/18 10:27	04/03/18 00:12	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-143	20	03/23/18 10:27	04/03/18 00:12	2051-24-3	S4
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:19	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	53	%.	30-125	1	03/23/18 10:26	03/26/18 15:19	877-09-8	
Decachlorobiphenyl (S)	44	%.	30-125	1	03/23/18 10:26	03/26/18 15:19	2051-24-3	
8315A GCSV Aldehydes		Analytical Method: EPA 8315A Preparation Method: EPA 8315A						
Formaldehyde	ND	ug/L	100	1	03/29/18 09:32	03/30/18 11:31	50-00-0	H3
8316 W GCSV Acrylamide		Analytical Method: EPA 8316						
Acrylamide	ND	ug/L	20.0	1		03/29/18 15:35	79-06-1	H1
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/23/18 10:26	03/23/18 13:27	7429-90-5	
Barium, Dissolved	132	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:27	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:27	7440-50-8	
Manganese, Dissolved	267	ug/L	5.0	1	03/23/18 10:26	03/23/18 13:27	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:27	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:27	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/23/18 10:26	03/23/18 13:27	7440-31-5	
Total Hardness by 2340B, Dissolved	2120000	ug/L	3300	1	03/23/18 10:26	03/23/18 13:27		
Zinc, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:27	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 21:57	7440-36-0	
Arsenic, Dissolved	ND	ug/L	2.5	5	03/23/18 09:55	03/27/18 22:06	7440-38-2	D3
Beryllium, Dissolved	ND	ug/L	0.20	1	03/23/18 09:55	03/27/18 21:57	7440-41-7	
Boron, Dissolved	399000	ug/L	25000	5000	03/23/18 09:55	03/30/18 10:19	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/23/18 09:55	03/27/18 21:57	7440-43-9	
Chromium, Dissolved	22.2	ug/L	0.50	1	03/23/18 09:55	03/27/18 21:57	7440-47-3	
Cobalt, Dissolved	ND	ug/L	2.5	5	03/23/18 09:55	03/27/18 22:06	7440-48-4	D3
Lead, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 21:57	7439-92-1	
Selenium, Dissolved	ND	ug/L	2.5	5	03/23/18 09:55	03/27/18 22:06	7782-49-2	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5	Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Thallium, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 21:57	7440-28-0	
Uranium-238, Dissolved	1.2	ug/L	0.50	1	03/23/18 09:55	03/27/18 21:57	7440-61-1	
Vanadium, Dissolved	102	ug/L	1.0	1	03/23/18 09:55	03/27/18 21:57	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	03/23/18 08:40	03/27/18 11:52	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	83-32-9	
Anthracene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	50-32-8	
Benzoic acid	ND	ug/L	52.1	1	03/22/18 12:56	03/30/18 11:28	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.1	1	03/22/18 12:56	03/30/18 11:28	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.1	1	03/22/18 12:56	03/30/18 11:28	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	206-44-0	
Fluorene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.1	1	03/22/18 12:56	03/30/18 11:28	77-47-4	
Hexachloroethane	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	67-72-1	
Isophorone	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.8	1	03/22/18 12:56	03/30/18 11:28		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	86-30-6	
Pentachlorophenol	ND	ug/L	20.8	1	03/22/18 12:56	03/30/18 11:28	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	85-01-8	
Phenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	108-95-2	
Pyrene	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	03/22/18 12:56	03/30/18 11:28	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	80	%	60-125	1	03/22/18 12:56	03/30/18 11:28	4165-60-0	
2-Fluorobiphenyl (S)	89	%	56-125	1	03/22/18 12:56	03/30/18 11:28	321-60-8	
p-Terphenyl-d14 (S)	99	%	58-125	1	03/22/18 12:56	03/30/18 11:28	1718-51-0	
Phenol-d6 (S)	88	%	58-125	1	03/22/18 12:56	03/30/18 11:28	13127-88-3	
2-Fluorophenol (S)	81	%	55-125	1	03/22/18 12:56	03/30/18 11:28	367-12-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Sample: FD-A5	Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV	Analytical Method: EPA 8270D Preparation Method: EPA 3520							
Surrogates								
2,4,6-Tribromophenol (S)	99	%	65-125	1	03/22/18 12:56	03/30/18 11:28	118-79-6	
524.2 MSV	Analytical Method: EPA 524.2							
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/02/18 14:46		
Surrogates								
4-Bromofluorobenzene (S)	96	%	75-125	1		04/02/18 14:46	460-00-4	1M
Toluene-d8 (S)	96	%	75-125	1		04/02/18 14:46	2037-26-5	
1,2-Dichloroethane-d4 (S)	101	%	75-125	1		04/02/18 14:46	17060-07-0	
Hach 10360 Rev 1.1 BOD	Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360							
BOD, 5 day	13.2	mg/L	6.0	3	03/22/18 12:31	03/27/18 10:31		B4,B6
1664 HEM, Oil and Grease	Analytical Method: EPA 1664A OG							
Oil and Grease	ND	mg/L	5.4	1		03/28/18 10:51		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	145	NTU	6.0	20		03/22/18 17:01		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	12.0	mg/L	10.0	1		03/27/18 15:13		
4500CIO2 Chlorine Dioxide	Analytical Method: SM 4500-CIO2							
Chlorine Dioxide	0.45	mg/L	0.10	1		03/28/18 15:13		H6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.1	Std. Units	0.10	1		03/27/18 13:57		H6
300.0 IC Anions	Analytical Method: EPA 300.0							
Fluoride	ND	mg/L	0.050	1		03/31/18 01:06	16984-48-8	
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	500	100		04/01/18 19:32		D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr D Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		03/22/18 10:55		FS,H1
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	72.7	mg/L	1.6	40		03/23/18 12:41	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		03/22/18 15:40	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/22/18 15:40	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/22/18 15:40		FS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5		Lab ID: 10424447001	Collected: 03/21/18 10:00	Received: 03/21/18 18:12	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:15		H1,H2
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	52.0	ug/L	10.0	1	03/26/18 09:50	03/26/18 11:53	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.38	mg/L	0.050	1	03/27/18 09:22	03/27/18 12:48	7723-14-0	

Sample: FD-B5		Lab ID: 10424447002	Collected: 03/21/18 13:20	Received: 03/21/18 18:12	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	309-00-2	
alpha-BHC	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	319-84-6	
beta-BHC	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	319-85-7	
delta-BHC	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	58-89-9	
Chlordane (Technical)	ND	ug/L	5.6	10	03/23/18 10:27	04/03/18 00:31	57-74-9	
alpha-Chlordane	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	5103-71-9	
gamma-Chlordane	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	5103-74-2	
4,4'-DDD	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	72-54-8	
4,4'-DDE	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	72-55-9	
4,4'-DDT	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	50-29-3	
Dieldrin	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	60-57-1	
Endosulfan I	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	959-98-8	
Endosulfan II	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	33213-65-9	
Endosulfan sulfate	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	1031-07-8	
Endrin	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	72-20-8	
Endrin aldehyde	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	7421-93-4	
Endrin ketone	ND	ug/L	1.1	10	03/23/18 10:27	04/03/18 00:31	53494-70-5	
Heptachlor	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	76-44-8	
Heptachlor epoxide	ND	ug/L	0.56	10	03/23/18 10:27	04/03/18 00:31	1024-57-3	
Methoxychlor	ND	ug/L	5.6	10	03/23/18 10:27	04/03/18 00:31	72-43-5	
Toxaphene	ND	ug/L	16.9	10	03/23/18 10:27	04/03/18 00:31	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	62-125	10	03/23/18 10:27	04/03/18 00:31	877-09-8	3M, D3, S4
Decachlorobiphenyl (S)	0	%	30-143	10	03/23/18 10:27	04/03/18 00:31	2051-24-3	S4
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	53469-21-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-B5		Lab ID: 10424447002	Collected: 03/21/18 13:20	Received: 03/21/18 18:12	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:35	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	42	%.	30-125	1	03/23/18 10:26	03/26/18 15:35	877-09-8	
Decachlorobiphenyl (S)	35	%.	30-125	1	03/23/18 10:26	03/26/18 15:35	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/23/18 10:26	03/23/18 13:35	7429-90-5	
Barium, Dissolved	253	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:35	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:35	7440-50-8	
Manganese, Dissolved	361	ug/L	5.0	1	03/23/18 10:26	03/23/18 13:35	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:35	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:35	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/23/18 10:26	03/23/18 13:35	7440-31-5	
Total Hardness by 2340B, Dissolved	1010000	ug/L	3300	1	03/23/18 10:26	03/23/18 13:35		
Zinc, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:35	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-36-0	
Arsenic, Dissolved	1.3	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/23/18 09:55	03/27/18 22:11	7440-41-7	
Boron, Dissolved	10700	ug/L	1250	250	03/23/18 09:55	03/30/18 11:05	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/23/18 09:55	03/27/18 22:11	7440-43-9	
Chromium, Dissolved	2.5	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-47-3	
Cobalt, Dissolved	0.71	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 22:11	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 22:11	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:11	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/23/18 09:55	03/27/18 22:11	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	03/23/18 08:40	03/27/18 11:55	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	83-32-9	
Anthracene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	50-32-8	
Benzoic acid	ND	ug/L	53.2	1	03/22/18 12:56	03/30/18 11:57	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

Sample: FD-B5	Lab ID: 10424447002	Collected: 03/21/18 13:20	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
2-Chlorophenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	53.2	1	03/22/18 12:56	03/30/18 11:57	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	120-83-2	
Diethylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	84-66-2	
2,4-Dimethylphenol	ND	ug/L	53.2	1	03/22/18 12:56	03/30/18 11:57	105-67-9	
Dimethylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	117-81-7	
Fluoranthene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	206-44-0	
Fluorene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	86-73-7	
Hexachlorobenzene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	53.2	1	03/22/18 12:56	03/30/18 11:57	77-47-4	
Hexachloroethane	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	67-72-1	
Isophorone	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.3	1	03/22/18 12:56	03/30/18 11:57		
N-Nitrosodiphenylamine	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	86-30-6	
Pentachlorophenol	ND	ug/L	21.3	1	03/22/18 12:56	03/30/18 11:57	87-86-5	
Phenanthrene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	85-01-8	
Phenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	108-95-2	
Pyrene	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.6	1	03/22/18 12:56	03/30/18 11:57	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	76	%	60-125	1	03/22/18 12:56	03/30/18 11:57	4165-60-0	
2-Fluorobiphenyl (S)	88	%	56-125	1	03/22/18 12:56	03/30/18 11:57	321-60-8	
p-Terphenyl-d14 (S)	103	%	58-125	1	03/22/18 12:56	03/30/18 11:57	1718-51-0	
Phenol-d6 (S)	86	%	58-125	1	03/22/18 12:56	03/30/18 11:57	13127-88-3	
2-Fluorophenol (S)	79	%	55-125	1	03/22/18 12:56	03/30/18 11:57	367-12-4	
2,4,6-Tribromophenol (S)	93	%	65-125	1	03/22/18 12:56	03/30/18 11:57	118-79-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	6.8	mg/L	6.0	3	03/22/18 12:31	03/27/18 10:36		B4,B6
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.4	1		03/28/18 10:51		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	200	NTU	15.0	50		03/22/18 17:04		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	111	mg/L	10.0	1		03/27/18 11:11		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-B5		Lab ID: 10424447002		Collected: 03/21/18 13:20	Received: 03/21/18 18:12	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	6.7	Std. Units	0.10	1		03/27/18 14:14		H6
300.0 IC Anions		Analytical Method: EPA 300.0						
Fluoride	0.12	mg/L	0.050	1		03/31/18 01:22	16984-48-8	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr D Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/22/18 10:36		FS
350.1 Ammonia		Analytical Method: EPA 350.1						
Nitrogen, Ammonia	8.1	mg/L	0.40	10		03/23/18 11:57	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	ND	mg/L	0.020	1		03/22/18 15:41	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/22/18 15:41	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/22/18 15:41		FS
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	12.4	ug/L	10.0	1	03/26/18 09:50	03/26/18 11:53	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.11	mg/L	0.050	1	03/27/18 09:22	03/27/18 12:50	7723-14-0	

Sample: FD-D5		Lab ID: 10424447003		Collected: 03/21/18 15:45	Received: 03/21/18 18:12	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	309-00-2	
alpha-BHC	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	319-84-6	
beta-BHC	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	319-85-7	
delta-BHC	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	58-89-9	
Chlordane (Technical)	ND	ug/L	0.53	1	03/23/18 10:27	04/02/18 23:18	57-74-9	
alpha-Chlordane	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	5103-71-9	
gamma-Chlordane	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	5103-74-2	
4,4'-DDD	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	72-54-8	
4,4'-DDE	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	72-55-9	
4,4'-DDT	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	50-29-3	
Dieldrin	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	60-57-1	
Endosulfan I	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	959-98-8	
Endosulfan II	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	1031-07-8	
Endrin	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	72-20-8	
Endrin aldehyde	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	7421-93-4	
Endrin ketone	ND	ug/L	0.11	1	03/23/18 10:27	04/02/18 23:18	53494-70-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-D5		Lab ID: 10424447003	Collected: 03/21/18 15:45	Received: 03/21/18 18:12	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Heptachlor	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	76-44-8	
Heptachlor epoxide	ND	ug/L	0.053	1	03/23/18 10:27	04/02/18 23:18	1024-57-3	
Methoxychlor	ND	ug/L	0.53	1	03/23/18 10:27	04/02/18 23:18	72-43-5	
Toxaphene	ND	ug/L	1.6	1	03/23/18 10:27	04/02/18 23:18	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	89	%.	62-125	1	03/23/18 10:27	04/02/18 23:18	877-09-8	
Decachlorobiphenyl (S)	42	%.	30-143	1	03/23/18 10:27	04/02/18 23:18	2051-24-3	
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/23/18 10:26	03/26/18 15:51	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	45	%.	30-125	1	03/23/18 10:26	03/26/18 15:51	877-09-8	
Decachlorobiphenyl (S)	37	%.	30-125	1	03/23/18 10:26	03/26/18 15:51	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/23/18 10:26	03/23/18 13:38	7429-90-5	
Barium, Dissolved	910	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:38	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:38	7440-50-8	
Manganese, Dissolved	801	ug/L	5.0	1	03/23/18 10:26	03/23/18 13:38	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:38	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/23/18 10:26	03/23/18 13:38	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/23/18 10:26	03/23/18 13:38	7440-31-5	
Total Hardness by 2340B, Dissolved	1060000	ug/L	3300	1	03/23/18 10:26	03/23/18 13:38		
Zinc, Dissolved	53.6	ug/L	20.0	1	03/23/18 10:26	03/23/18 13:38	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	1.7	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-36-0	
Arsenic, Dissolved	7.8	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/23/18 09:55	03/27/18 22:24	7440-41-7	
Boron, Dissolved	15600	ug/L	1250	250	03/23/18 09:55	03/30/18 11:10	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/23/18 09:55	03/27/18 22:24	7440-43-9	
Chromium, Dissolved	14.2	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-47-3	
Cobalt, Dissolved	1.5	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-48-4	
Lead, Dissolved	64.8	ug/L	0.10	1	03/23/18 09:55	03/27/18 22:24	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/23/18 09:55	03/27/18 22:24	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/23/18 09:55	03/27/18 22:24	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/23/18 09:55	03/27/18 22:24	7440-62-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-D5	Lab ID: 10424447003	Collected: 03/21/18 15:45	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/23/18 08:40	03/27/18 12:02	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	83-32-9	
Anthracene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	50-32-8	
Benzoic acid	ND	ug/L	51.5	1	03/22/18 12:56	03/30/18 12:27	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	111-44-4	
2-Chlorophenol	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.5	1	03/22/18 12:56	03/30/18 12:27	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	120-83-2	
Diethylphthalate	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	84-66-2	
2,4-Dimethylphenol	ND	ug/L	51.5	1	03/22/18 12:56	03/30/18 12:27	105-67-9	
Dimethylphthalate	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	117-81-7	
Fluoranthene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	206-44-0	
Fluorene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	86-73-7	
Hexachlorobenzene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.5	1	03/22/18 12:56	03/30/18 12:27	77-47-4	
Hexachloroethane	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	67-72-1	
Isophorone	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.6	1	03/22/18 12:56	03/30/18 12:27		
N-Nitrosodiphenylamine	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	86-30-6	
Pentachlorophenol	ND	ug/L	20.6	1	03/22/18 12:56	03/30/18 12:27	87-86-5	
Phenanthrene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	85-01-8	
Phenol	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	108-95-2	
Pyrene	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	03/22/18 12:56	03/30/18 12:27	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	75	%	60-125	1	03/22/18 12:56	03/30/18 12:27	4165-60-0	
2-Fluorobiphenyl (S)	89	%	56-125	1	03/22/18 12:56	03/30/18 12:27	321-60-8	
p-Terphenyl-d14 (S)	89	%	58-125	1	03/22/18 12:56	03/30/18 12:27	1718-51-0	
Phenol-d6 (S)	84	%	58-125	1	03/22/18 12:56	03/30/18 12:27	13127-88-3	
2-Fluorophenol (S)	78	%	55-125	1	03/22/18 12:56	03/30/18 12:27	367-12-4	
2,4,6-Tribromophenol (S)	92	%	65-125	1	03/22/18 12:56	03/30/18 12:27	118-79-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	ND	mg/L	20.0	10	03/22/18 12:31	03/27/18 10:45		B4,B6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-D5	Lab ID: 10424447003	Collected: 03/21/18 15:45	Received: 03/21/18 18:12	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1664 HEM, Oil and Grease	Analytical Method: EPA 1664A OG							
Oil and Grease	ND	mg/L	5.4	1		03/28/18 10:51		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	302	NTU	15.0	50		03/22/18 17:05		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	60.0	mg/L	10.0	1		03/27/18 11:11		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.8	Std. Units	0.10	1		03/27/18 14:17		H6
300.0 IC Anions	Analytical Method: EPA 300.0							
Fluoride	0.18	mg/L	0.050	1		03/31/18 01:37	16984-48-8	
Chromium, Hexavalent	Analytical Method: SM 3500-Cr D Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		03/22/18 10:36		FS,M1
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	15.5	mg/L	0.40	10		03/23/18 11:58	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		03/22/18 15:43	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/22/18 15:43	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/22/18 15:43		FS
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	20.6	ug/L	10.0	1	03/26/18 09:50	03/26/18 11:54	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.40	mg/L	0.050	1	03/27/18 09:22	03/27/18 12:50	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 436495 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10424447001

METHOD BLANK: 2370792 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	03/29/18 17:29	

LABORATORY CONTROL SAMPLE: 2370793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	45.7	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370794 2370795

Parameter	Units	35382120001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	43.8	45.2	88	90	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370796 2370797

Parameter	Units	10424606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	36.4	36.2	73	72	80-120	0	30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 435508 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10424447001

METHOD BLANK: 2011284 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/04/18 13:46	

LABORATORY CONTROL SAMPLE: 2011285

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	56.4	113	79-111	L3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011376 2011377

Parameter	Units	60266710003 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec						
Methanol	mg/L	ND	50	50	46.8	46.4	94	93	43-138	1	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 435081	Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol	Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10424447001	

METHOD BLANK: 2009741 Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/02/18 16:08	

LABORATORY CONTROL SAMPLE: 2009742

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	24.8	99	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009945 2009946

Parameter	Units	2009945		2009946		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10424606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Ethylene glycol	mg/L	ND	25	25	14.4	25.6	58	103	38-154	56	20 R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 19069

Analysis Method: EPA 8316

QC Batch Method: EPA 8316

Analysis Description: 8316 W GCSV Acrylamide

Associated Lab Samples: 10424447001

METHOD BLANK: 75864

Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	03/29/18 15:20	

LABORATORY CONTROL SAMPLE: 75865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1030	103	80-120	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528713

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury - Dissolved

Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869488

Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	03/27/18 11:48	

LABORATORY CONTROL SAMPLE: 2869489

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869490 2869491

Parameter	Units	10424447002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	ND	Spike Conc.	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Mercury, Dissolved	ug/L	ND	ND	5	5	5.3	5.2	106	105	70-130	1	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528712 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869484 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	03/23/18 13:22	
Barium, Dissolved	ug/L	ND	10.0	03/23/18 13:22	
Copper, Dissolved	ug/L	ND	10.0	03/23/18 13:22	
Manganese, Dissolved	ug/L	ND	5.0	03/23/18 13:22	
Nickel, Dissolved	ug/L	ND	20.0	03/23/18 13:22	
Silver, Dissolved	ug/L	ND	10.0	03/23/18 13:22	
Tin, Dissolved	ug/L	ND	75.0	03/23/18 13:22	
Zinc, Dissolved	ug/L	ND	20.0	03/23/18 13:22	

LABORATORY CONTROL SAMPLE: 2869485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21100	106	85-115	
Barium, Dissolved	ug/L	1000	1020	102	85-115	
Copper, Dissolved	ug/L	1000	982	98	85-115	
Manganese, Dissolved	ug/L	1000	1020	102	85-115	
Nickel, Dissolved	ug/L	1000	1010	101	85-115	
Silver, Dissolved	ug/L	500	488	98	85-115	
Tin, Dissolved	ug/L	1000	995	100	85-115	
Zinc, Dissolved	ug/L	1000	1000	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869486 2869487

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	22800	22900	114	114	70-130	0	30
Barium, Dissolved	ug/L	132	1000	1000	1140	1140	101	101	70-130	0	30
Copper, Dissolved	ug/L	ND	1000	1000	1070	1070	107	107	70-130	0	30
Manganese, Dissolved	ug/L	267	1000	1000	1260	1270	99	100	70-130	0	30
Nickel, Dissolved	ug/L	ND	1000	1000	933	937	93	93	70-130	0	30
Silver, Dissolved	ug/L	ND	500	500	524	526	105	105	70-130	0	30
Tin, Dissolved	ug/L	ND	1000	1000	953	960	94	95	70-130	1	30
Zinc, Dissolved	ug/L	ND	1000	1000	911	918	91	92	70-130	1	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528701 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869446 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Arsenic, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Beryllium, Dissolved	ug/L	ND	0.20	03/27/18 20:58	
Boron, Dissolved	ug/L	ND	5.0	03/27/18 20:58	
Cadmium, Dissolved	ug/L	ND	0.080	03/27/18 20:58	
Chromium, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Cobalt, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Lead, Dissolved	ug/L	ND	0.10	03/27/18 20:58	
Selenium, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Thallium, Dissolved	ug/L	ND	0.10	03/27/18 20:58	
Uranium-238, Dissolved	ug/L	ND	0.50	03/27/18 20:58	
Vanadium, Dissolved	ug/L	ND	1.0	03/27/18 20:58	

LABORATORY CONTROL SAMPLE: 2869447

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	111	111	85-115	
Arsenic, Dissolved	ug/L	100	112	112	85-115	
Beryllium, Dissolved	ug/L	100	113	113	85-115	
Boron, Dissolved	ug/L	100	113	113	85-115	
Cadmium, Dissolved	ug/L	100	110	110	85-115	
Chromium, Dissolved	ug/L	100	111	111	85-115	
Cobalt, Dissolved	ug/L	100	109	109	85-115	
Lead, Dissolved	ug/L	100	113	113	85-115	
Selenium, Dissolved	ug/L	100	115	115	85-115	
Thallium, Dissolved	ug/L	100	110	110	85-115	
Uranium-238, Dissolved	ug/L	100	111	111	85-115	
Vanadium, Dissolved	ug/L	100	112	112	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869448 2869449

Parameter	Units	30246525001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Antimony, Dissolved	ug/L	ND	100	100	111	109	110	108	70-130	2	20	
Arsenic, Dissolved	ug/L	ND	100	100	110	107	110	107	70-130	3	20	
Beryllium, Dissolved	ug/L	ND	100	100	68.8	65.1	68	65	70-130	6	20	M6
Boron, Dissolved	ug/L	35400	100	100	35200	30700	-200	-4740	70-130	14	20	M6
Cadmium, Dissolved	ug/L	ND	100	100	94.6	91.4	95	91	70-130	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869448		2869449		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		30246525001 Result	MS Spike Conc.	MSD Spike Conc.								
Chromium, Dissolved	ug/L	ND	100	100	114	110	114	110	70-130	4	20	
Cobalt, Dissolved	ug/L	14.6	100	100	139	135	125	120	70-130	3	20	
Lead, Dissolved	ug/L	ND	100	100	99.2	94.9	99	95	70-130	4	20	
Selenium, Dissolved	ug/L	ND	100	100	93.2	94.4	92	94	70-130	1	20	
Thallium, Dissolved	ug/L	7.9	100	100	109	106	101	99	70-130	3	20	
Uranium-238, Dissolved	ug/L	ND	100	100	115	111	115	111	70-130	4	20	
Vanadium, Dissolved	ug/L	ND	100	100	116	112	116	112	70-130	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 530204 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10424447001

METHOD BLANK: 2878023 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/02/18 12:48	
1,2-Dichloroethane-d4 (S)	%.	100	75-125	04/02/18 12:48	
4-Bromofluorobenzene (S)	%.	98	75-125	04/02/18 12:48	
Toluene-d8 (S)	%.	97	75-125	04/02/18 12:48	

LABORATORY CONTROL SAMPLE: 2878024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	80.0	100	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			96	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878707 2878708

Parameter	Units	10425345001		2878708		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	76.7	81.1	96	101	70-130	5 20
1,2-Dichloroethane-d4 (S)	%.						100	99	75-125	
4-Bromofluorobenzene (S)	%.						97	97	75-125	HS
Toluene-d8 (S)	%.						98	99	75-125	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 435581 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10424447001

METHOD BLANK: 2366828 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	03/27/18 10:27	

LABORATORY CONTROL SAMPLE: 2366829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.5	77	70-130	

LABORATORY CONTROL SAMPLE: 2366830

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	.33J	83	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367284 2367285

Parameter	Units	35381489001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diquat	ug/L	<0.30	2	2	1.6	1.5	79	76	70-130	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367286 2367287

Parameter	Units	35381489002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diquat	ug/L	<0.30	2	2	1.6	1.6	79	81	70-130	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 435937 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10424447001

METHOD BLANK: 2368198 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
Dichloroacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
Haloacetic Acids (Total)	ug/L	ND	1.0	03/29/18 15:10	
Monobromoacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
Monochloroacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
Trichloroacetic Acid	ug/L	ND	1.0	03/29/18 15:10	
2,3-Dibromopropanoic Acid (S)	%	89	70-130	03/29/18 15:10	

LABORATORY CONTROL SAMPLE: 2368199

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	10.6	106	70-130	
Dichloroacetic Acid	ug/L	10	10.3	103	70-130	
Haloacetic Acids (Total)	ug/L	50	53.4	107		
Monobromoacetic Acid	ug/L	10	10.9	109	70-130	
Monochloroacetic Acid	ug/L	10	11.2	112	70-130	
Trichloroacetic Acid	ug/L	10	10.5	105	70-130	
2,3-Dibromopropanoic Acid (S)	%			92	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368425 2368426

Parameter	Units	35380326001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Dibromoacetic Acid	ug/L	<0.43	10	10	10.4	10.8	100	104	104	70-130	4	30	
Dichloroacetic Acid	ug/L	<0.24	10	10	9.9	10.3	99	103	103	70-130	4	30	
Haloacetic Acids (Total)	ug/L	<0.67	50	50	51.6	54.2	102	108	108		5	30	
Monobromoacetic Acid	ug/L	<0.29	10	10	10	10.9	100	109	109	70-130	9	30	
Monochloroacetic Acid	ug/L	<0.90	10	10	10.9	11.7	109	117	117	70-130	7	30	
Trichloroacetic Acid	ug/L	<0.26	10	10	10.4	10.6	104	106	106	70-130	1	30	
2,3-Dibromopropanoic Acid (S)	%						91	88	88	70-130		30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368427 2368428

Parameter	Units	35380330001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Dibromoacetic Acid	ug/L	0.49J	10	10	11.0	11.3	105	108	108	70-130	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Parameter	Units	35380330001		2368427		2368428		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Dichloroacetic Acid	ug/L	<0.24	10	10	10.5	10.7	103	105	70-130	2	30			
Haloacetic Acids (Total)	ug/L	0.68J	50	50	54.3	54.5	107	108		0	30			
Monobromoacetic Acid	ug/L	<0.29	10	10	10.8	10.6	108	106	70-130	2	30			
Monochloroacetic Acid	ug/L	<0.90	10	10	11.4	11.0	114	110	70-130	4	30			
Trichloroacetic Acid	ug/L	<0.26	10	10	10.6	11.0	106	110	70-130	4	30			
2,3-Dibromopropanoic Acid (S)	%						87	97	70-130		30			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528742 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869568 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/02/18 22:23	
4,4'-DDE	ug/L	ND	0.10	04/02/18 22:23	
4,4'-DDT	ug/L	ND	0.10	04/02/18 22:23	
Aldrin	ug/L	ND	0.050	04/02/18 22:23	
alpha-BHC	ug/L	ND	0.050	04/02/18 22:23	
alpha-Chlordane	ug/L	ND	0.050	04/02/18 22:23	
beta-BHC	ug/L	ND	0.050	04/02/18 22:23	
Chlordane (Technical)	ug/L	ND	0.50	04/02/18 22:23	
delta-BHC	ug/L	ND	0.050	04/02/18 22:23	
Dieldrin	ug/L	ND	0.10	04/02/18 22:23	
Endosulfan I	ug/L	ND	0.050	04/02/18 22:23	
Endosulfan II	ug/L	ND	0.10	04/02/18 22:23	
Endosulfan sulfate	ug/L	ND	0.10	04/02/18 22:23	
Endrin	ug/L	ND	0.10	04/02/18 22:23	
Endrin aldehyde	ug/L	ND	0.10	04/02/18 22:23	
Endrin ketone	ug/L	ND	0.10	04/02/18 22:23	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/02/18 22:23	
gamma-Chlordane	ug/L	ND	0.050	04/02/18 22:23	
Heptachlor	ug/L	ND	0.050	04/02/18 22:23	
Heptachlor epoxide	ug/L	ND	0.050	04/02/18 22:23	
Methoxychlor	ug/L	ND	0.50	04/02/18 22:23	
Toxaphene	ug/L	ND	1.5	04/02/18 22:23	
Decachlorobiphenyl (S)	%	78	30-143	04/02/18 22:23	
Tetrachloro-m-xylene (S)	%	95	62-125	04/02/18 22:23	

LABORATORY CONTROL SAMPLE & LCSD: 2869569

Parameter	Units	2869570							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.1	1.1	108	113	67-125	5	20		
4,4'-DDE	ug/L	1	1.0	1.1	103	110	68-125	6	20		
4,4'-DDT	ug/L	1	1.0	1.1	105	111	66-125	5	20	CH	
Aldrin	ug/L	.5	0.40	0.44	80	88	46-125	10	20		
alpha-BHC	ug/L	.5	0.51	0.54	102	109	66-125	6	20		
alpha-Chlordane	ug/L	.5	0.49	0.52	97	104	72-125	6	20		
beta-BHC	ug/L	.5	0.51	0.53	101	107	72-125	5	20		
delta-BHC	ug/L	.5	0.50	0.53	100	106	37-141	6	20		
Dieldrin	ug/L	1	1.1	1.2	108	115	71-125	6	20		
Endosulfan I	ug/L	.5	0.44	0.46	88	93	69-125	6	20		
Endosulfan II	ug/L	1	1.0	1.1	104	110	73-125	5	20		
Endosulfan sulfate	ug/L	1	0.95	1.0	95	100	63-127	5	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

LABORATORY CONTROL SAMPLE & LCSD: 2869569		2869570									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Endrin	ug/L	1	1.0	1.1	100	106	72-125	6	20		
Endrin aldehyde	ug/L	1	0.97	1.0	97	102	70-125	5	20		
Endrin ketone	ug/L	1	1.1	1.1	107	112	72-127	5	20		
gamma-BHC (Lindane)	ug/L	.5	0.51	0.54	103	109	69-125	6	20		
gamma-Chlordane	ug/L	.5	0.45	0.48	89	95	64-125	7	20		
Heptachlor	ug/L	.5	0.47	0.51	94	103	54-125	9	20		
Heptachlor epoxide	ug/L	.5	0.50	0.53	99	105	72-125	6	20		
Methoxychlor	ug/L	5	5.6	5.9	113	117	67-127	4	20	CH	
Decachlorobiphenyl (S)	%.				79	80	30-143				
Tetrachloro-m-xylene (S)	%.				93	98	62-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528740

Analysis Method: EPA 8082A

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8082A GCS PCB

Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869563

Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	03/26/18 14:48	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	03/26/18 14:48	
Decachlorobiphenyl (S)	%	71	30-125	03/26/18 14:48	
Tetrachloro-m-xylene (S)	%	57	30-125	03/26/18 14:48	

LABORATORY CONTROL SAMPLE & LCSD: 2869564

2869565

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.4	1.4	70	68	47-125	3	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.5	1.5	73	74	54-125	0	20	
Decachlorobiphenyl (S)	%				76	75	30-125			
Tetrachloro-m-xylene (S)	%				64	59	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528628 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2868857 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	03/29/18 23:33	
2,4-Dichlorophenol	ug/L	ND	10.0	03/29/18 23:33	
2,4-Dimethylphenol	ug/L	ND	50.0	03/29/18 23:33	
2,4-Dinitrophenol	ug/L	ND	10.0	03/29/18 23:33	
2-Chlorophenol	ug/L	ND	10.0	03/29/18 23:33	
2-Methylnaphthalene	ug/L	ND	10.0	03/29/18 23:33	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	03/29/18 23:33	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	03/29/18 23:33	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	03/29/18 23:33	
4-Bromophenylphenyl ether	ug/L	ND	10.0	03/29/18 23:33	
Acenaphthene	ug/L	ND	10.0	03/29/18 23:33	
Anthracene	ug/L	ND	10.0	03/29/18 23:33	
Benzo(a)pyrene	ug/L	ND	10.0	03/29/18 23:33	
Benzoic acid	ug/L	ND	50.0	03/29/18 23:33	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	03/29/18 23:33	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	03/29/18 23:33	
Butylbenzylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Di-n-butylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Di-n-octylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Diethylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Dimethylphthalate	ug/L	ND	10.0	03/29/18 23:33	
Fluoranthene	ug/L	ND	10.0	03/29/18 23:33	
Fluorene	ug/L	ND	10.0	03/29/18 23:33	
Hexachlorobenzene	ug/L	ND	10.0	03/29/18 23:33	
Hexachlorocyclopentadiene	ug/L	ND	50.0	03/29/18 23:33	
Hexachloroethane	ug/L	ND	10.0	03/29/18 23:33	
Isophorone	ug/L	ND	10.0	03/29/18 23:33	
N-Nitrosodiphenylamine	ug/L	ND	10.0	03/29/18 23:33	
Pentachlorophenol	ug/L	ND	20.0	03/29/18 23:33	
Phenanthrene	ug/L	ND	10.0	03/29/18 23:33	
Phenol	ug/L	ND	10.0	03/29/18 23:33	
Pyrene	ug/L	ND	10.0	03/29/18 23:33	
2,4,6-Tribromophenol (S)	%	72	65-125	03/29/18 23:33	
2-Fluorobiphenyl (S)	%	85	56-125	03/29/18 23:33	
2-Fluorophenol (S)	%	82	55-125	03/29/18 23:33	
Nitrobenzene-d5 (S)	%	79	60-125	03/29/18 23:33	
p-Terphenyl-d14 (S)	%	101	58-125	03/29/18 23:33	
Phenol-d6 (S)	%	83	58-125	03/29/18 23:33	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

LABORATORY CONTROL SAMPLE & LCSD: 2868858		2868859									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	39.6	39.4	79	79	74-125	0	20		
2,4-Dichlorophenol	ug/L	50	40.8	36.3	82	73	68-125	12	20		
2,4-Dimethylphenol	ug/L	50	34.5J	34J	69	68	33-125		20		
2,4-Dinitrophenol	ug/L	50	32.9	35.0	66	70	30-127	6	20		
2-Chlorophenol	ug/L	50	39.9	32.9	80	66	61-125	19	20		
2-Methylnaphthalene	ug/L	50	41.8	36.9	84	74	67-125	13	20		
2-Methylphenol(o-Cresol)	ug/L	50	38.3	33.6	77	67	63-125	13	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	39.2	35.2	78	70	67-125	11	20		
3,3'-Dichlorobenzidine	ug/L	50	45.4J	45J	91	90	60-125		20		
4-Bromophenylphenyl ether	ug/L	50	42.9	42.3	86	85	75-125	1	20		
Acenaphthene	ug/L	50	40.2	40.3	80	81	74-125	0	20		
Anthracene	ug/L	50	43.7	43.8	87	88	75-125	0	20		
Benzo(a)pyrene	ug/L	50	42.1	43.2	84	86	75-125	2	20		
Benzoic acid	ug/L	50	24.5J	26.5J	49	53	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	38.5	31.5	77	63	55-125	20	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	40.9	41.2	82	82	72-129	1	20		
Butylbenzylphthalate	ug/L	50	41.3	40.9	83	82	69-127	1	20		
Di-n-butylphthalate	ug/L	50	41.1	41.4	82	83	75-125	1	20		
Di-n-octylphthalate	ug/L	50	41.1	41.9	82	84	69-131	2	20		
Diethylphthalate	ug/L	50	41.6	42.4	83	85	75-125	2	20		
Dimethylphthalate	ug/L	50	41.2	42.4	82	85	75-125	3	20		
Fluoranthene	ug/L	50	42.9	43.8	86	88	75-125	2	20		
Fluorene	ug/L	50	41.4	42.1	83	84	75-125	2	20		
Hexachlorobenzene	ug/L	50	42.2	42.1	84	84	74-125	0	20		
Hexachlorocyclopentadiene	ug/L	50	19.3J	ND	39	34	30-125		20		
Hexachloroethane	ug/L	50	36.6	30.4	73	61	30-125	18	20		
Isophorone	ug/L	50	39.8	36.4	80	73	72-125	9	20		
N-Nitrosodiphenylamine	ug/L	50	41.9	41.3	84	83	75-125	1	20		
Pentachlorophenol	ug/L	50	36.3	37.3	73	75	52-125	3	20		
Phenanthrene	ug/L	50	42.7	43.5	85	87	75-125	2	20		
Phenol	ug/L	50	40.0	33.5	80	67	59-125	18	20		
Pyrene	ug/L	50	43.5	43.8	87	88	75-125	1	20		
2,4,6-Tribromophenol (S)	%				84	90	65-125				
2-Fluorobiphenyl (S)	%				90	87	56-125				
2-Fluorophenol (S)	%				85	71	55-125				
Nitrobenzene-d5 (S)	%				84	72	60-125				
p-Terphenyl-d14 (S)	%				95	98	58-125				
Phenol-d6 (S)	%				86	74	58-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 18993	Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A	Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10424447001	

METHOD BLANK: 75621 Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	03/30/18 11:19	

LABORATORY CONTROL SAMPLE: 75622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	403	101	44-176	

MATRIX SPIKE SAMPLE: 75623

Parameter	Units	40166480001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	1560	400	1620	17	35-167	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528575

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2868655

Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	03/27/18 10:07	B4,B6

LABORATORY CONTROL SAMPLE: 2868657

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	235	119	85-115	B4,B6

SAMPLE DUPLICATE: 2868658

Parameter	Units	10424336001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	608	582	4	20	B4,B6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 529209 Analysis Method: EPA 1664A OG
 QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
 Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2872311 Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	03/27/18 13:47	

LABORATORY CONTROL SAMPLE: 2872312

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	33.3	83	78-114	

MATRIX SPIKE SAMPLE: 2872313

Parameter	Units	10424341001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	45.5	41.2	87	78-114	

SAMPLE DUPLICATE: 2872314

Parameter	Units	10424276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	ND	ND		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528669 Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1 Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869206 Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/22/18 16:58	

LABORATORY CONTROL SAMPLE: 2869207

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.2	98	90-110	

SAMPLE DUPLICATE: 2869208

Parameter	Units	10424447001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	145	157	8	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 529149 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10424447002, 10424447003

METHOD BLANK: 2872133 Matrix: Water
Associated Lab Samples: 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/27/18 11:11	

LABORATORY CONTROL SAMPLE: 2872134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	84.0	84	80-120	

SAMPLE DUPLICATE: 2872135

Parameter	Units	10424556001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	19.0	18.0	5	10	

SAMPLE DUPLICATE: 2872136

Parameter	Units	10424561001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	839	832	1	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 529277 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10424447001

METHOD BLANK: 2872638 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/27/18 15:13	

LABORATORY CONTROL SAMPLE: 2872639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	82.0	82	80-120	

SAMPLE DUPLICATE: 2872640

Parameter	Units	10424927021 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	132	129	2	10	H3

SAMPLE DUPLICATE: 2872641

Parameter	Units	10424927022 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	49.0	50.0	2	10	H3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 436075	Analysis Method: SM 4500-CIO2
QC Batch Method: SM 4500-CIO2	Analysis Description: 4500CIO2 Chlorine Dioxide
Associated Lab Samples: 10424447001	

METHOD BLANK: 2368981 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	03/28/18 15:13	H6

LABORATORY CONTROL SAMPLE: 2368982

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	94	90-110	H6

SAMPLE DUPLICATE: 2368983

Parameter	Units	10424447001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.45	0.46	2	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 529218 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10424447001, 10424447002, 10424447003

LABORATORY CONTROL SAMPLE: 2872361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	100	98-102	H6

SAMPLE DUPLICATE: 2872362

Parameter	Units	10424592001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.6	10.6	0	3	H6

SAMPLE DUPLICATE: 2872363

Parameter	Units	92378064001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.4	5.4	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 437078	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10424447001	

METHOD BLANK: 2373461 Matrix: Water
Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/01/18 11:32	

LABORATORY CONTROL SAMPLE: 2373462

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	37.5	94	85-115	

MATRIX SPIKE SAMPLE: 2373464

Parameter	Units	35382915001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	638U	20000	18500	93	75-125	

SAMPLE DUPLICATE: 2373463

Parameter	Units	35382915001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	638U	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528552 Analysis Method: SM 3500-Cr D Modified
QC Batch Method: SM 3500-Cr D Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2868603 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/22/18 10:36	FS

LABORATORY CONTROL SAMPLE: 2868604

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868605 2868606

Parameter	Units	10424447003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	.2	.2	.0057J	.0065J	1	1	85-115		20	FS,M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528718 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2869504 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.040	03/23/18 10:34	

LABORATORY CONTROL SAMPLE: 2869505

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869506 2869507

Parameter	Units	10424422001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	1	1	1.0	1.0	100	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869508 2869509

Parameter	Units	10424547001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	1	1	1.1	1.0	103	98	90-110	5	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

QC Batch: 528625 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2868845 Matrix: Water
Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/22/18 15:44	FS
Nitrite as N	mg/L	ND	0.020	03/22/18 15:44	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/22/18 15:44	FS

LABORATORY CONTROL SAMPLE: 2868846

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.99	99	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.98	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2868847 2868848

Parameter	Units	10424302002		2868847		2868848		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Nitrite as N	mg/L	<0.0062	1	1	0.97	1.0	97	102	90-110	5	20		
Nitrogen, NO2 plus NO3	mg/L	<0.0075	1	1	0.96	1.0	96	100	90-110	4	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 19623 Analysis Method: EPA 9016
 QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
 Associated Lab Samples: 10424447001

METHOD BLANK: 77969 Matrix: Water
 Associated Lab Samples: 10424447001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971 77972

Parameter	Units	10424606001		77971		77972		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Cyanide, Free	ug/L	ND	150	150	160	160	106	106	80-120	0	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 528953

Analysis Method: SM 4500-CN-E

QC Batch Method: SM 4500-CN-E

Analysis Description: SM4500CN-E Cyanide

Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2870951

Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	03/26/18 11:40	

LABORATORY CONTROL SAMPLE: 2870952

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	255	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870953 2870954

Parameter	Units	10424637001		2870953		2870954		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Cyanide	ug/L	ND	250	250	5.4J	216	2	86	80-120	30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 529144 Analysis Method: SM 4500-P E
 QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
 Associated Lab Samples: 10424447001, 10424447002, 10424447003

METHOD BLANK: 2872122 Matrix: Water

Associated Lab Samples: 10424447001, 10424447002, 10424447003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	03/27/18 11:58	

LABORATORY CONTROL SAMPLE: 2872123

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872124 2872125

Parameter	Units	10424580001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Phosphorus	mg/L	920 ug/L	1	1	1.3	1.3	40	42	80-120	2	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872126 2872127

Parameter	Units	10424861001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Phosphorus	mg/L	ND	1	1	1.2	1.2	114	119	80-120	5	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Sample: FD-A5 **Lab ID: 10424447001** Collected: 03/21/18 10:00 Received: 03/21/18 18:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	3.75 ± 7.77 (14.7) C:NA T:NA	pCi/L	03/29/18 18:15	12587-46-1	
Gross Beta	EPA 900.0	142 ± 26.9 (8.34) C:NA T:NA	pCi/L	03/29/18 18:15	12587-47-2	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

QC Batch: 292947

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10424447001

METHOD BLANK: 1433553

Matrix: Water

Associated Lab Samples: 10424447001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.243 ± 0.706 (1.79) C:NA T:NA	pCi/L	03/30/18 08:54	
Gross Beta	1.53 ± 1.40 (2.86) C:NA T:NA	pCi/L	03/30/18 08:54	

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424447

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-O Pace Analytical Services - Ormond Beach
PASI-PA Pace Analytical Services - Greensburg

WORKORDER QUALIFIERS

WO: 10424447
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 19125
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

BATCH QUALIFIERS

Batch: 529070

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 529209

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 529242

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M Post-analysis pH measurement indicates insufficient VOA sample preservation. Therefore, analysis was conducted outside the recognized method holding time.

2M Sample was dark grey in color and grainy. Sample needed to be centrifuged and decanted. Emulsion was also present during extraction.

3M Sample was light grey in color and grainy. Sample needed to be centrifuged and decanted. Emulsion was also present during extraction.

B4 The glucose/glutamic acid standard exceeded the range of 198 plus or minus 30.5 mg/L.

B6 The calculated seed correction exceeded the range of 0.6 to 1.0 mg/L.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the EPA method holding time.

H1 Analysis conducted outside the recognized method holding time.

H2 Extraction or preparation conducted outside EPA method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

HS Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

P4 Sample field preservation does not meet EPA or method recommendations for this analysis.

R1 RPD value was outside control limits.

S4 Surrogate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424447001	FD-A5	EPA 547	436495		
10424447001	FD-A5	EPA 549.2	435581	EPA 549.2	435759
10424447001	FD-A5	EPA 552.3	435937	EPA 552.3	436444
10424447001	FD-A5	EPA 8015 Alcohol-Glycol	435508		
10424447001	FD-A5	EPA 8015 Alcohol-Glycol	435081		
10424447001	FD-A5	EPA Mod. 3510C	528742	EPA 8081B	530201
10424447002	FD-B5	EPA Mod. 3510C	528742	EPA 8081B	530201
10424447003	FD-D5	EPA Mod. 3510C	528742	EPA 8081B	530201
10424447001	FD-A5	EPA Mod. 3510C	528740	EPA 8082A	529070
10424447002	FD-B5	EPA Mod. 3510C	528740	EPA 8082A	529070
10424447003	FD-D5	EPA Mod. 3510C	528740	EPA 8082A	529070
10424447001	FD-A5	EPA 8315A	18993	EPA 8315A	19125
10424447001	FD-A5	EPA 8316	19069		
10424447001	FD-A5	EPA 200.7	528712	EPA 200.7	528795
10424447002	FD-B5	EPA 200.7	528712	EPA 200.7	528795
10424447003	FD-D5	EPA 200.7	528712	EPA 200.7	528795
10424447001	FD-A5	EPA 200.8	528701	EPA 200.8	528991
10424447002	FD-B5	EPA 200.8	528701	EPA 200.8	528991
10424447003	FD-D5	EPA 200.8	528701	EPA 200.8	528991
10424447001	FD-A5	EPA 245.1	528713	EPA 245.1	528803
10424447002	FD-B5	EPA 245.1	528713	EPA 245.1	528803
10424447003	FD-D5	EPA 245.1	528713	EPA 245.1	528803
10424447001	FD-A5	EPA 3520	528628	EPA 8270D	529242
10424447002	FD-B5	EPA 3520	528628	EPA 8270D	529242
10424447003	FD-D5	EPA 3520	528628	EPA 8270D	529242
10424447001	FD-A5	EPA 524.2	530204		
10424447001	FD-A5	EPA 900.0	292947		
10424447001	FD-A5	Hach 10360	528575	Hach 10360 Rev 1.1	528774
10424447002	FD-B5	Hach 10360	528575	Hach 10360 Rev 1.1	528774
10424447003	FD-D5	Hach 10360	528575	Hach 10360 Rev 1.1	528774
10424447001	FD-A5	EPA 1664A OG	529209		
10424447002	FD-B5	EPA 1664A OG	529209		
10424447003	FD-D5	EPA 1664A OG	529209		
10424447001	FD-A5	EPA 180.1	528669		
10424447002	FD-B5	EPA 180.1	528669		
10424447003	FD-D5	EPA 180.1	528669		
10424447001	FD-A5	SM 2540D	529277		
10424447002	FD-B5	SM 2540D	529149		
10424447003	FD-D5	SM 2540D	529149		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424447

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424447001	FD-A5	SM 4500-CIO2	436075		
10424447001	FD-A5	SM 4500-H+B	529218		
10424447002	FD-B5	SM 4500-H+B	529218		
10424447003	FD-D5	SM 4500-H+B	529218		
10424447001	FD-A5	EPA 300.0	529627		
10424447002	FD-B5	EPA 300.0	529627		
10424447003	FD-D5	EPA 300.0	529627		
10424447001	FD-A5	EPA 300.1	437078		
10424447001	FD-A5	EPA 300.1	437079		
10424447001	FD-A5	SM 3500-Cr D Modified	528552		
10424447002	FD-B5	SM 3500-Cr D Modified	528552		
10424447003	FD-D5	SM 3500-Cr D Modified	528552		
10424447001	FD-A5	EPA 350.1	528718		
10424447002	FD-B5	EPA 350.1	528718		
10424447003	FD-D5	EPA 350.1	528718		
10424447001	FD-A5	EPA 353.2	528625		
10424447002	FD-B5	EPA 353.2	528625		
10424447003	FD-D5	EPA 353.2	528625		
10424447001	FD-A5	EPA 9016	19623	EPA 9016	19643
10424447001	FD-A5	SM 4500-CN-E	528953	SM 4500-CN-E	529003
10424447002	FD-B5	SM 4500-CN-E	528953	SM 4500-CN-E	529003
10424447003	FD-D5	SM 4500-CN-E	528953	SM 4500-CN-E	529003
10424447001	FD-A5	SM 4500-P B	529144	SM 4500-P E	529202
10424447002	FD-B5	SM 4500-P B	529144	SM 4500-P E	529202
10424447003	FD-D5	SM 4500-P B	529144	SM 4500-P E	529202

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Chain-of-Custody Form

Work Order Number:

Turnaround Time:

WO#: 10424447



10424447

PROJECT/CLIENT INFO

Facility Code: MPCA Freeway LF waters

Program Code (MDH Lab Only):

Lab Name:

Project Name: MPCA Freeway LF waters

Project Task Code:

Address: 18-00383

Project Manager:

EPIC Profile # 38710

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
Wt-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS		Lab Sample No.	#
												PRESERV.			
FD-AS	S	3/21/18	1000	NA	NA	G	NW	Wt-Ground	N		33	X	List A+B	601	1
FD-BS	S	3/21/18	1320	NA	NA	G	NW	Wt-Ground	N		16		List A	602	2
FD-DS	S	3/21/18	1545	NA	NA	G	NW	Wt-Ground	N		16		X	603	3
															4
															5
															6
															7
															8
															9
															10

Sampled By: Chris Pelosi

Sampler's Signature: *Chiff Ph*

Phone #: 612-597-7254

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<i>Chiff Ph</i> Pace	3/21/18 1811	<i>myself</i> Pace	3/21/18 1812

T=6.7, 9.4, 9.3, 7.1, 9.0°C

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved ①	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260.LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

① metals - Dissolved per 3/19/18 email from Mark Umholtz. B6J-3/19/18

Sample Condition Upon Receipt

Client Name: Pace Field

Project #: **WO# : 10424447**
 PM: BM2 Due Date: 04/05/18
 CLIENT: PAST-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: FB Temp Blank? Yes No
 Thermometer Used: 151401163 65, 9.1, 9.2, 6.9 G87A9155100842 8.5 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): _____ Cooler Temp Corrected (°C): 6.7, 9.4, 9.3, 7.1, 9.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: 3/21/18, SD

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>FD-DS sample time 1540. COC says 1545</u>
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: <u>VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.</u>	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N Sample # <u>14/4 1-3 1/1 1-3 3/3 2-3 1/1</u> AS pH <u>10.8</u> DS pH <u>10.8</u> Initial when completed: <u>SD</u> Lot # of added preservative: <u>117041</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Field Data Required? Yes No

Project Manager Review: _____

Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

SCUR Exceptions:

Workorder #:

Issue	Sample ID	Container Type/#

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials
FD-A5	HNO ₃	4	3/21/18	2:30	2mL	11704	1	SD
"	"	6	"	"	"	"	1	SD
"	"	3	"	"	"	"	1	SD
"	"	6	"	"	1mL	"	1	SD

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424447 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To	Subcontract To	Requested Analysis
Bob Michels Pace Analytical Minnesota - 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600	

WO# : 30247380

30247380

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta EPA 900.0	LAB USE ONLY	
						HNO3						
1	FD-A5	PS	3/21/2018 10:00	10424447001	Water	3				X		001
2												
3												
4												
5												

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/26/18/1645	<i>[Signature]</i>	3-27-18	020
2					
3					

Cooler Temperature on Receipt 2.8 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace AL

Project # 30247380

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7254

Label	<u>DS</u>
LIMS Login	<u>DS</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 6 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 2.8 °C Correction Factor: 0.0 °C Final Temp: 2.8 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DS 3-27-18</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>phcd</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
exceptions: VOA, coliform, TOC, O&G, Phenolics	Initial when completed: <u>DS</u>		Date/time of preservation	
	Lot # of added preservative			
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DS</u> Date: <u>3-27-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

WO# : 35381956

(SCUR)

Project #
Project Manager:
Client:

PM: ADC **Due Date: 04/05/18**
CLIENT: PACMIN

Date and Initials of person:
Examining contents: _____
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T315 Date: 3/24/18 Time: 1118 Initials: AKP

State of Origin: _____

- | | |
|--|--|
| Cooler #1 Temp.°C <u>1.3</u> (Visual) <u>1.0</u> (Correction Factor) <u>2.3</u> (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #2 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #3 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #4 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #5 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #6 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |

- Courier:** Fed Ex UPS USPS Client Commercial Pace Other _____
- Shipping Method:** First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 0957

Custody Seal on Cooler/Box Present: Yes No **Seals intact:** Yes No **Ice:** Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) **Shorted Date:** _____ **Shorted Time:** _____ **Qty:** _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: _____

Date: _____

Chain of Custody

NO#: 35381956



Samples were sent

State Of Origin: MN



Workorder: 10424447

Workorder Name: 18-00383 MPCA Freeway LF Water

Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To		Subcontract To					Requested Analysis																		
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers			Bromate/Chlorite EPA 300.1	Chlorine Dioxide SM4500ClO2	Diquat EPA 549.2	Glyphosate EPA 547	Haloacetic acids, total (HAA5) EPA	LAB USE ONLY											
						Unpreserved	Other	NA2S2O3																	
1	FD-A5	PS	3/21/2018 10:00	10424447001	Water	2	2	1	X	X	X	X	X												
2																									
3																									
4																									
5																									

Transfers						Comments
Released By	Date/Time	Received By	Date/Time			
<i>[Signature]</i>	3/20/18 1645	<i>[Signature]</i>	3/27/18 1840			*Diquat already in FL

Cooler Temperature on Receipt 1.6 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #
Project Manager:
Client:

WO# : 35381956

PM: ADC **Due Date: 04/05/18**
CLIENT: PACMIN

Date and Initials of person:

Examining contents:
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T-315 Date: 3-27-18 Time: 1040 Initials: NMP

State of Origin: _____

Cooler #1 Temp. °C .6 (Visual) +1 (Correction Factor) 1.6 (Actual)
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)

- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 7265

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments): _____

Project Manager Review: _____

Date: _____

WO#: 469925



469925

bcontracting Laboratory.

State Of Origin: MN



Contract Name: 18-00383 MPCA Freeway LF Water

Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To		Subcontract To				Requested Analysis																																		
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Grand Rapids 5560 Corporate Exchange Court Grand Rapids, MI 49512 USA Phone (616)975-4500				<div style="float: right;">15-S-1</div> <div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Acrylamide EPA 8316 PDFW</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Formaldehyde EPA 8315 PGRM</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Free Cyanide method 9016</div> </div> <div style="text-align: right;">LAB USE ONLY</div>																																		
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Acrylamide EPA 8316 PDFW	Formaldehyde EPA 8315 PGRM	Free Cyanide method 9016																											
						Unpreserved	Other																																	
1	FD-A5	PS	3/21/2018 10:00	10424447001	Water	2	1					X	X	X																										
2																																								
3																																								
4																																								
5																																								
Transfers		Released By		Date/Time		Received By		Date/Time		Comments																														
1		<i>[Signature]</i>		3/26/18 17:00		<i>[Signature]</i>		3/27/18 09:30																																
2																																								
3																																								
Cooler Temperature on Receipt			°C	Custody Seal Y or N			Received on Ice Y or N			Samples Intact Y or N																														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: <u>Pace Minnesota</u>	Work Order #: <u>469928</u>
Receipt Record Page/Line #: <u>15-5</u>	Project Chemist: _____ Sample #: _____

Recorded by (initials/date): <u>RS 8/27/18</u>	<input type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other _____	Qty Received: <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used: <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> See Additional Cooler Information Form <input type="checkbox"/> Other (# _____)
--	---	------------------------	---

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time	
<u>Red</u>	<u>1030</u>							
Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C
Temp Blank:			Temp Blank:			Temp Blank:		
Sample 1:	<u>1.8</u>	<u>1.8</u>	Sample 1:			Sample 1:		
Sample 2:	<u>1.7</u>	<u>1.7</u>	Sample 2:			Sample 2:		
Sample 3:	<u>1.0</u>	<u>1.0</u>	Sample 3:			Sample 3:		
3 Sample Average °C: _____			3 Sample Average °C: _____			3 Sample Average °C: _____		
<input type="checkbox"/> Cooler ID on COC?			<input type="checkbox"/> Cooler ID on COC?			<input type="checkbox"/> Cooler ID on COC?		
<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes No Chain of Custody record(s)? If No, Initiated By _____
 Received for Lab Signed/Date/Time? _____

Shipping document?
 Other _____

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes No Analysis Requested?
 Sample ID matches COC?
 Sample Date and Time matches COC?
 Container type completed on COC?
 All container types indicated are received?

Sample Condition Summary

N/A Yes No

Broken containers/lids?
 Missing or incomplete labels?
 Illegible information on labels?
 Low volume received?
 Inappropriate or non-Pace containers received?
 VOC vials / TOX containers have headspace?
 Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6° C?
 If either is ≥6° C, was thermal preservation required?
 If "Yes", Project Chemist Approval Initials: _____
 If "Yes" Completed Non Con Cooler - Cont Inventory Form?
 Completed Sample Preservation Verification Form?
 Samples chemically preserved correctly?
 If "No", added orange tag?
 Received pre-preserved VOC soils?
 MeOH Na₂SO₄

Check for Short Hold-Time Prep/Analyses

Bacteriological
 Air Bags
 EnCores / Methanol Pre-Preserved
 Formaldehyde/Aldehyde
 Green-tagged containers
 Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:
 COPIES OF COC TO LAB AREA(S)
 NONE RECEIVED
 RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
<u>RS 8/27/18</u>	<u>RS 8/27/18</u>	Yes / No



AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: Pace - Minnesota Work Order #: 469925
 Receipt Log #: IS-S-1 Completed By (initials/date): TS 3/27/18 Project Manager: _____

COC ID #		Adjusted by: _____ Date: _____												
Container Type	5 / 23	4		13		6		15						
Preservative	NaOH >12	H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1	10													
COC Line #2														
COC Line #3														
COC Line #4														
COC Line #5														
COC Line #6														
COC Line #7														
COC Line #8														
COC Line #9														
COC Line #10														
COC Line #11														
COC Line #12														

pH Strip Reagent or Lot #
 HC727135
 Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID #		Adjusted by: _____ Date: _____												
Container Type	5 / 23	4		13		6		15						
Preservative	NaOH >12	H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1														
COC Line #2														
COC Line #3														
COC Line #4														
COC Line #5														
COC Line #6														
COC Line #7														
COC Line #8														
COC Line #9														
COC Line #10														
COC Line #11														
COC Line #12														

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____

Chain of Custody

A181209



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424447 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/21/2018 Results Requested By: 4/5/2018

Report To		Subcontract To				Requested Analysis																																																																																																																																							
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700				<table border="1"> <tr> <th colspan="6">Preserved Containers</th> <th rowspan="2">Herbicides EPA 8151 MDA List II</th> <th rowspan="2">Pesticides MDA List I (8270 Pest)</th> <th colspan="6"></th> <th rowspan="2">LAB USE ONLY</th> </tr> <tr> <th>Item</th> <th>Sample ID</th> <th>Sample Type</th> <th>Collect Date/Time</th> <th>Lab ID</th> <th>Matrix</th> <th>Unpreserved</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <td>1</td> <td>FD-A5</td> <td>PS</td> <td>3/21/2018 10:00</td> <td>10424447001</td> <td>Water</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>01</td> </tr> <tr> <td>2</td> <td>FD-B5</td> <td>PS</td> <td>3/21/2018 13:20</td> <td>10424447002</td> <td>Water</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>HOLD 02</td> </tr> <tr> <td>3</td> <td>FD-D5</td> <td>PS</td> <td>3/21/2018 15:45</td> <td>10424447003</td> <td>Water</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>HOLD 03</td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>												Preserved Containers						Herbicides EPA 8151 MDA List II	Pesticides MDA List I (8270 Pest)							LAB USE ONLY	Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved								1	FD-A5	PS	3/21/2018 10:00	10424447001	Water	2						X	X					01	2	FD-B5	PS	3/21/2018 13:20	10424447002	Water	2						X	X					HOLD 02	3	FD-D5	PS	3/21/2018 15:45	10424447003	Water	2						X	X					HOLD 03	4																			5																		
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***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 7/12/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424447

Workorder Name: 18-00383 MPCA Freeway LF Water

Owner Received Date: 3/21/2018

Results Requested By: 4/5/2018

Report To		Subcontract To					Requested Analysis																																																																																															
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Methyl alcohol/Ethylene glycol EPA</div> <div style="border: 1px solid black; padding: 5px;"> <table border="1"> <thead> <tr> <th colspan="12">Preserved Containers</th> </tr> <tr> <th>Unpreserved</th> <th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> </div> <div style="text-align: right; margin-top: 20px;"> <p>50192063 LAB USE ONLY</p> <p>001</p> </div> </div>												Preserved Containers												Unpreserved												1												2												3												4												5											
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SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193063

Date/Time and Initials of person examining contents: 3/27/18 1550 *dy*

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7232

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: ① 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 1.4/1.5 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl. All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)				Circle: HNO3 H2SO4 NaOH NaOH/ZnAc		
Chain of Custody Present:			Dissolved Metals field filtered?:			
Chain of Custody Filled Out:			Headspace Wisconsin Sulfide			
Short Hold Time Analysis (<72hr)?: Analysis:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (Total/Amenable/Free Cyanide)			
Rush TAT Requested:			Headspace in VOA Vials (>6mm):			
Containers Intact?:			Trip Blank Present?:			
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:			

Comments:

Sample Container Count

WO#: 50193063

CLIENT: Pace mn

DC PAGE 1 of 1

DC ID# _____

Project # 50193063

SBS
Bulk
K



Sample Line Item	DC9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	DG9U	Matrix (Soil/Aque)	pH <2	pH >9	pH >12
1																			2	WT			
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VGSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
W9AU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
W9FU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
J9FU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 04, 2018

Bob Michels
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/23/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10424447 Project Manager: Bob Michels
--	--

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-A5 (10424447001)	A181209-01	Water	03/21/2018	03/23/2018

CASE NARRATIVE

Sample Receipt Information:

3 samples were received on 03/23/2018. Samples were received at 2.9 degrees Celsius. Samples were received in acceptable condition.

Analysis for samples A181209-02 and A181209-03 was put on hold per the client.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LCS recovery indicates a potential high bias for 2,4,5-T, 2,4,5-TP (silvex) and triclopyr for sample A181209-01. Sample was less than the reporting limit for these analytes so no further action is required.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for 2,4,5-TP, bentazon, dicamba, MCPA and triclopyr for sample A181209-01. Sample was less than the reporting limit for this analyte so no further action is required.

Additional Comments:

Sample A181209-01 had to be run at an initial dilution factor of 1:10 for the base neutral pesticides by GC/MS analysis, due to the sample matrix. The limit of detection and limit of quantitation have been raised accordingly.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424447
 Project Manager: Bob Michels

FD-A5 (10424447001)

Date Sampled
03/21/2018 10:00

A181209-01 (Water)

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A803143

Acetochlor	ND	0.47	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Alachlor	ND	0.48	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Atrazine	ND	0.41	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Chlorpyrifos	ND	0.54	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Cyanazine	ND	0.91	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Desethylatrazine	ND	0.18	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Deisopropylatrazine	ND	0.52	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Dimethenamid	ND	0.23	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
EPTC	ND	0.61	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Ethalfuralin	ND	1.3	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Fonofos	ND	0.32	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Metolachlor	ND	0.28	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Metribuzin	ND	0.33	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Pendimethalin	ND	0.38	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Phorate	ND	0.58	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Prometon	ND	0.78	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Propachlor	ND	0.22	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Propazine	ND	0.65	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Simazine	ND	0.47	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Terbufos	ND	0.32	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Triallate	ND	0.59	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	
Trifluralin	ND	0.16	1.6	ug/L	10	03/26/2018	03/29/2018 14:02	EPA 8270D	

Surrogate: Atrazine-d5		107 %	65.1-122			03/26/2018	03/29/2018 14:02	EPA 8270D	D
Surrogate: Parathion-d10		220 %	22.3-159			03/26/2018	03/29/2018 14:02	EPA 8270D	D, S
Surrogate: Triphenyl phosphate		264 %	65.2-151			03/26/2018	03/29/2018 14:02	EPA 8270D	D, S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A803149

2,4-D	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
2,4-DB	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
2,4,5-T	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
2,4,5-TP (Silvex)	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
Bentazon	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
Dicamba	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
MCPA	ND		0.30	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
Picloram	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	
Triclopyr	ND		0.50	ug/L	1	03/27/2018	03/30/2018 21:18	EPA 8151A	

Surrogate: 2,4-D-d5		125 %	44.2-121			03/27/2018	03/30/2018 21:18	EPA 8151A	S
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2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10424447
Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803143 - EPA 3510C

Blank (A803143-BLK1)

Prepared: 03/26/2018 Analyzed: 03/28/2018 15:29

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	0.403		ug/L	0.5000		80.6	65.1-122			
<i>Surrogate: Parathion-d10</i>	0.367		ug/L	0.5000		73.4	22.3-159			
<i>Surrogate: Triphenyl phosphate</i>	0.508		ug/L	0.5000		102	65.2-151			

LCS (A803143-BS1)

Prepared: 03/26/2018 Analyzed: 03/28/2018 20:03

Acetochlor	0.894	0.50	ug/L	1.000		89.4	67.5-120			
Alachlor	0.900	0.50	ug/L	1.000		90.0	71.7-120			
Atrazine	1.01	0.50	ug/L	1.000		101	72.8-113			
Chlorpyrifos	0.976	0.50	ug/L	1.000		97.6	65.3-119			
Cyanazine	0.959	0.20	ug/L	1.000		95.9	49.5-140			
Desethylatrazine	0.922	0.50	ug/L	1.000		92.2	66.9-116			
Deisopropylatrazine	0.740	0.50	ug/L	1.000		74.0	44.3-110			
Dimethenamid	0.950	0.50	ug/L	1.000		95.0	63.8-116			
EPTC	0.791	0.50	ug/L	1.000		79.1	41.7-102			
Ethalfuralin	1.03	0.50	ug/L	1.000		103	41-127			
Fonofos	1.03	0.50	ug/L	1.000		103	59.7-118			
Metolachlor	0.975	0.50	ug/L	1.000		97.5	71.7-122			
Metribuzin	1.02	0.50	ug/L	1.000		102	66.6-128			
Pendimethalin	1.09	0.50	ug/L	1.000		109	55.5-137			
Phorate	0.646	0.30	ug/L	1.000		64.6	41.2-114			
Prometon	0.938	0.50	ug/L	1.000		93.8	66.3-120			
Propachlor	1.04	0.50	ug/L	1.000		104	65.8-119			



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Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10424447 Project Manager: Bob Michels
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Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803143 - EPA 3510C

LCS (A803143-BS1)		Prepared: 03/26/2018 Analyzed: 03/28/2018 20:03								
Propazine	1.00	0.50	ug/L	1.000		100	72-122			
Simazine	0.946	0.50	ug/L	1.000		94.6	72.8-113			
Terbufos	0.699	0.20	ug/L	1.000		69.9	38.6-115			
Triallate	1.00	0.50	ug/L	1.000		100	51.4-116			
Trifluralin	1.06	0.50	ug/L	1.000		106	46.1-134			
<i>Surrogate: Atrazine-d5</i>	<i>0.452</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.4</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.731</i>		<i>ug/L</i>	<i>0.5000</i>		<i>146</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.526</i>		<i>ug/L</i>	<i>0.5000</i>		<i>105</i>	<i>65.2-151</i>			

Matrix Spike (A803143-MS1)		Source: A181205-06		Prepared: 03/26/2018 Analyzed: 03/29/2018 12:36						
Acetochlor	1.02	0.50	ug/L	0.9709	0.119	92.4	67.3-128			
Alachlor	0.864	0.50	ug/L	0.9709	ND	89.0	58.2-150			
Atrazine	0.901	0.50	ug/L	0.9709	0.0524	87.4	70.1-120			
Chlorpyrifos	0.918	0.50	ug/L	0.9709	ND	94.5	73.3-118			
Cyanazine	0.952	0.20	ug/L	0.9709	ND	98.0	60.6-140			
Desethylatrazine	1.02	0.50	ug/L	0.9709	0.187	86.2	69.7-122			
Deisopropylatrazine	0.706	0.50	ug/L	0.9709	ND	72.8	48-121			
Dimethenamid	0.918	0.50	ug/L	0.9709	0.0471	89.7	63.7-123			
EPTC	0.748	0.50	ug/L	0.9709	ND	77.0	58-109			
Ethalfluralin	0.736	0.50	ug/L	0.9709	ND	75.8	59.3-129			
Fonofos	0.786	0.50	ug/L	0.9709	ND	81.0	73.5-108			
Metolachlor	3.28	0.50	ug/L	0.9709	2.25	106	40.9-156			
Metribuzin	0.869	0.50	ug/L	0.9709	ND	89.5	70.9-136			
Pendimethalin	0.844	0.50	ug/L	0.9709	ND	86.9	55.4-155			
Phorate	0.672	0.30	ug/L	0.9709	ND	69.2	60.2-108			
Prometon	0.875	0.50	ug/L	0.9709	ND	90.1	74.7-124			
Propachlor	0.867	0.50	ug/L	0.9709	ND	89.3	72.3-115			
Propazine	0.884	0.50	ug/L	0.9709	ND	91.0	73.7-124			
Simazine	0.889	0.50	ug/L	0.9709	ND	91.5	74.8-114			
Terbufos	0.680	0.20	ug/L	0.9709	ND	70.1	56.1-114			
Triallate	0.822	0.50	ug/L	0.9709	ND	84.7	65.5-107			
Trifluralin	0.753	0.50	ug/L	0.9709	ND	77.6	58-149			
<i>Surrogate: Atrazine-d5</i>	<i>0.396</i>		<i>ug/L</i>	<i>0.4854</i>		<i>81.5</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.479</i>		<i>ug/L</i>	<i>0.4854</i>		<i>98.7</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.487</i>		<i>ug/L</i>	<i>0.4854</i>		<i>100</i>	<i>65.2-151</i>			

Matrix Spike Dup (A803143-MSD1)		Source: A181205-06		Prepared: 03/26/2018 Analyzed: 03/29/2018 13:04						
Acetochlor	1.08	0.50	ug/L	1.000	0.119	96.1	67.3-128	6.13	20	
Alachlor	0.943	0.50	ug/L	1.000	ND	94.3	58.2-150	8.67	20	
Atrazine	0.974	0.50	ug/L	1.000	0.0524	92.2	70.1-120	7.79	20	
Chlorpyrifos	0.980	0.50	ug/L	1.000	ND	98.0	73.3-118	6.56	20	
Cyanazine	1.01	0.20	ug/L	1.000	ND	101	60.6-140	5.78	20	
Desethylatrazine	1.09	0.50	ug/L	1.000	0.187	90.2	69.7-122	6.23	20	
Deisopropylatrazine	0.778	0.50	ug/L	1.000	ND	77.8	48-121	9.68	20	
Dimethenamid	1.01	0.50	ug/L	1.000	0.0471	96.8	63.7-123	9.96	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424447
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803143 - EPA 3510C

Matrix Spike Dup (A803143-MSD1)

Source: A181205-06

Prepared: 03/26/2018 Analyzed: 03/29/2018 13:04

EPTC	0.805	0.50	ug/L	1.000	ND	80.5	58-109	7.34	20	
Ethalfuralin	0.807	0.50	ug/L	1.000	ND	80.7	59.3-129	9.14	20	
Fonofos	0.851	0.50	ug/L	1.000	ND	85.1	73.5-108	7.88	20	
Metolachlor	3.49	0.50	ug/L	1.000	2.25	124	40.9-156	6.24	20	
Metribuzin	0.939	0.50	ug/L	1.000	ND	93.9	70.9-136	7.72	20	
Pendimethalin	0.912	0.50	ug/L	1.000	ND	91.2	55.4-155	7.75	20	
Phorate	0.732	0.30	ug/L	1.000	ND	73.2	60.2-108	8.56	20	
Prometon	0.965	0.50	ug/L	1.000	ND	96.5	74.7-124	9.86	20	
Propachlor	0.925	0.50	ug/L	1.000	ND	92.5	72.3-115	6.51	20	
Propazine	0.957	0.50	ug/L	1.000	ND	95.7	73.7-124	7.95	20	
Simazine	0.961	0.50	ug/L	1.000	ND	96.1	74.8-114	7.79	20	
Terbufos	0.733	0.20	ug/L	1.000	ND	73.3	56.1-114	7.38	20	
Triallate	0.876	0.50	ug/L	1.000	ND	87.6	65.5-107	6.42	20	
Trifluralin	0.839	0.50	ug/L	1.000	ND	83.9	58-149	10.8	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.399</i>		<i>ug/L</i>	<i>0.5000</i>		<i>79.7</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.511</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.529</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>65.2-151</i>			



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

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 Project Number: 10424447
 Project Manager: Bob Michels

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Limit of Quantitation	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803149 - EPA 3510C

Blank (A803149-BLK1)

Prepared: 03/27/2018 Analyzed: 03/30/2018 11:17

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

1.99

ug/L

2.016

98.5

44.2-121

LCS (A803149-BS1)

Prepared: 03/27/2018 Analyzed: 03/30/2018 13:36

2,4-D	2.80	0.50	ug/L	2.000		140	64.6-148			
2,4-DB	2.75	0.50	ug/L	2.000		138	66.7-143			
2,4,5-T	2.49	0.50	ug/L	2.000		124	63.4-133			
2,4,5-TP (Silvex)	2.86	0.50	ug/L	2.000		143	63-145			
Bentazon	1.31	0.50	ug/L	1.000		131	52.5-139			
Dicamba	2.70	0.50	ug/L	2.000		135	55.4-143			
MCPA	2.79	0.30	ug/L	2.000		140	33.5-143			
Picloram	1.07	0.50	ug/L	1.000		107	47.9-113			
Triclopyr	2.85	0.50	ug/L	2.000		142	65.1-141			

Surrogate: 2,4-D-d5

2.15

ug/L

2.016

107

44.2-121

LCS Dup (A803149-BSD1)

Prepared: 03/27/2018 Analyzed: 03/30/2018 14:12

2,4-D	2.80	0.50	ug/L	2.000		140	64.6-148	0.204	20	
2,4-DB	2.85	0.50	ug/L	2.000		143	66.7-143	3.54	20	
2,4,5-T	2.72	0.50	ug/L	2.000		136	63.4-133	8.80	20	
2,4,5-TP (Silvex)	2.93	0.50	ug/L	2.000		147	63-145	2.34	20	
Bentazon	1.33	0.50	ug/L	1.000		133	52.5-139	1.38	20	
Dicamba	2.72	0.50	ug/L	2.000		136	55.4-143	0.745	20	
MCPA	2.81	0.30	ug/L	2.000		141	33.5-143	0.778	20	
Picloram	1.03	0.50	ug/L	1.000		103	47.9-113	3.16	20	
Triclopyr	2.78	0.50	ug/L	2.000		139	65.1-141	2.45	20	

Surrogate: 2,4-D-d5

2.25

ug/L

2.016

112

44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

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Project Number: 10424447
Project Manager: Bob Michels

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

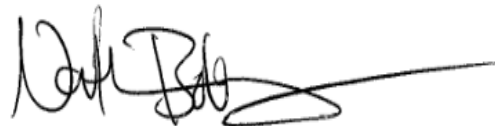
PaceProject#: 10424450
Sample Receipt Date: 03/21/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 04, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 4, 2018

DISCUSSION

This report presents the results from the analyses performed on three samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 79-86%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 98-99% with a relative percent difference of 1.0%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO# 10424450



10424450

 <p>Minnesota Pollution Control Agency</p>	<p>Chain-of-Custody Form</p>		<p>Work Order Number:</p>	
	<p>PROJECT/CLIENT INFO</p>		<p>Turnaround Time:</p>	
<p>Facility Code:</p>	<p>MPCA Freeway LF waters</p>		<p>Program Code (MDH Lab Only):</p>	<p>Lab Name:</p>
<p>Project Name:</p>	<p>MPCA Freeway LF waters</p>		<p>Project Task Code:</p>	<p>Address: 18-00383</p>
<p>Project Manager:</p>				<p>EPIC Profile # 38710</p>
<p>Potential Hazard?</p>	<p>If yes, add information to Sampler Comments Section</p>			<p>Phone No:</p>

Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED										
SAMPLE TYPE CODES				LAB MATRIX CODES				AR=Alt			FIELD MATRIX CODES				ANALYSIS	PRESERV.	Lab Sample No.	#			
Sample	Type	Date	Time	Start Depth	End Depth	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Filter	Volume	Special Handling	# of Cont								
FD-A5	S	3/21/18	1000	NA	NA	G	NW	Wtr-Ground	N						X	01	1				
FD-B5	S	3/21/18	1320	NA	NA	G	NW	Wtr-Ground	N						X	02	2				
FD-D5	S	3/21/18	1545	NA	NA	G	NW	Wtr-Ground	N						X	03	3				
																	4				
																	5				
																	6				
																	7				
																	8				
																	9				
																	10				

Sampled By: Chris Pelosi Sampler's Signature: Cliff Ph Phone #: 612-597-7254

Receiving Comments:			
Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
<u>Cliff Ph</u> <u>Pace</u>	<u>3/21/18 1811</u>	<u>Ang Vent</u> <u>Pace</u>	<u>3/21/18 1812</u>

T=6.7, 9.7, 9.3, 7.1, 9.0°C

Sample Condition Upon Receipt

Client Name: Pace Field

Project #:

WO# : 10424450
 PM: SCU Due Date: 04/12/18
 CLIENT: (PACU-MN)FLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No
 Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: FB
 Temp Blank? Yes No

Thermometer Used: 151401163 69.9, 9.2, 6.9
 G87A9155100842 5.8
 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): _____ Cooler Temp Corrected (°C): 6.7, 9.4, 9.7, 9.0
 Temp should be above freezing to 6°C Correction Factor: 10.2
 Biological Tissue Frozen? Yes No N/A
 Date and Initials of Person Examining Contents: 3/21/18 JS

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>FD-DS sample have 1545 COC says 1545</u>
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>14/4 1-3 1/1 1-3 3/6</u> Res pH <u>10.49</u>
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: <u>JS</u> Lot # of added preservative: <u>11/20/11</u>
Headspace in VOA Vials (>5mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____
 Field Data Required? Yes No

Project Manager Review: [Signature] Date: 03/22/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

(1) metals - Dissolved per 3/19/18 email from Mark Umholtz. B6J-3/19/18

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Malonic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved Metals per 3/19/18 m. umol	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
**VOCs*	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

*- * Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 81.51 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-A5		
Lab Sample ID	10424450001		
Filename	U180402A_03		
Injected By	BAL		
Total Amount Extracted	494 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/21/2018 10:00
ICAL ID	U171222	Received	03/21/2018 18:12
CCal Filename(s)	U180401B_18	Extracted	03/23/2018 11:45
Method Blank ID	BLANK-61282	Analyzed	04/02/2018 05:16

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	84
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	96

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-B5		
Lab Sample ID	10424450002		
Filename	U180402A_04		
Injected By	BAL		
Total Amount Extracted	515 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/21/2018 13:20
ICAL ID	U171222	Received	03/21/2018 18:12
CCal Filename(s)	U180401B_18	Extracted	03/23/2018 11:45
Method Blank ID	BLANK-61282	Analyzed	04/02/2018 05:59

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	79
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	92

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-D5		
Lab Sample ID	10424450003		
Filename	U180402A_05		
Injected By	BAL		
Total Amount Extracted	494 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/21/2018 15:45
ICAL ID	U171222	Received	03/21/2018 18:12
CCal Filename(s)	U180401B_18	Extracted	03/23/2018 11:45
Method Blank ID	BLANK-61282	Analyzed	04/02/2018 06:41

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	86
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	94

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61282	Matrix	Water
Filename	U180329A_19	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 16:30
CCal Filename(s)	U180329A_06	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	79
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	98

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61283	Matrix	Water
Filename	U180329A_20	Dilution	NA
Total Amount Extracted	949 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 17:12
CCal Filename	U180329A_06	Injected By	SMT
Method Blank ID	BLANK-61282		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.8	7.3	14.6	98
2,3,7,8-TCDD-37Cl4	10	8.3	3.7	15.8	83
2,3,7,8-TCDD-13C	100	77	25.0	141.0	77

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61284	Matrix	Water
Filename	U180329A_21	Dilution	NA
Total Amount Extracted	983 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 17:55
CCal Filename	U180329A_06	Injected By	SMT
Method Blank ID	BLANK-61282		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.9	7.3	14.6	99
2,3,7,8-TCDD-37Cl4	10	8.5	3.7	15.8	85
2,3,7,8-TCDD-13C	100	77	25.0	141.0	77

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61283
 Spike 1 Filename U180329A_20

Spike 2 ID LCSD-61284
 Spike 2 Filename U180329A_21

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	98	99	1.0

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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April 17, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 22, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Unionized Ammonia was not calculated for sample FD-SB-E5 due to insufficient volume to conduct the field pH & Temperature..

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Alaska Certification UST-107
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424606001	FD-SB-E5	Water	03/22/18 15:00	03/22/18 17:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424606001	FD-SB-E5	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	WFH	1	PASI-O
		EPA 552.3	LJM	7	PASI-O
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	PW1	1	PASI-M
		EPA 548.1	WFH	1	PASI-O
		EPA 8270D	AT1	38	PASI-M
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		Hach 10360 Rev 1.1	DCL	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	AR3	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	2	PASI-M
		EPA 300.1	CMD	1	PASI-O
		EPA 300.1	CMD	1	PASI-O
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
SM 4500-CN-E	DCL	1	PASI-M		
SM 4500-P E	DCL	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Carbofuran	ND	ug/L	2.0	1		03/29/18 03:39	1563-66-2	L1
Oxamyl	ND	ug/L	2.0	1		03/29/18 03:39	23135-22-0	
Surrogates								
BDMC (S)	90	%	80-120	1		03/29/18 03:39		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		03/29/18 21:38		M1
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	03/26/18 22:26	03/27/18 15:54	85-00-7	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05		
Monobromoacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	03/30/18 22:46	04/03/18 04:05	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	104	%	70-130	1	03/30/18 22:46	04/03/18 04:05	600-05-5	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/04/18 14:32	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/02/18 17:13	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	309-00-2	
alpha-BHC	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	319-84-6	
beta-BHC	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	319-85-7	
delta-BHC	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	58-89-9	
Chlordane (Technical)	ND	ug/L	0.55	1	03/27/18 14:00	04/05/18 17:36	57-74-9	
alpha-Chlordane	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	5103-71-9	
gamma-Chlordane	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	5103-74-2	
4,4'-DDD	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	72-54-8	
4,4'-DDE	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	72-55-9	
4,4'-DDT	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	50-29-3	
Dieldrin	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	60-57-1	
Endosulfan I	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	959-98-8	
Endosulfan II	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	1031-07-8	
Endrin	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	72-20-8	
Endrin aldehyde	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	7421-93-4	
Endrin ketone	ND	ug/L	0.11	1	03/27/18 14:00	04/05/18 17:36	53494-70-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Heptachlor	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	76-44-8	
Heptachlor epoxide	ND	ug/L	0.055	1	03/27/18 14:00	04/05/18 17:36	1024-57-3	
Methoxychlor	ND	ug/L	0.55	1	03/27/18 14:00	04/05/18 17:36	72-43-5	
Toxaphene	ND	ug/L	1.6	1	03/27/18 14:00	04/05/18 17:36	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	87	%	62-125	1	03/27/18 14:00	04/05/18 17:36	877-09-8	
Decachlorobiphenyl (S)	86	%	30-143	1	03/27/18 14:00	04/05/18 17:36	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:26	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	30-125	1	03/27/18 14:00	04/03/18 13:26	877-09-8	
Decachlorobiphenyl (S)	86	%	30-125	1	03/27/18 14:00	04/03/18 13:26	2051-24-3	
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	03/29/18 09:32	03/30/18 11:44	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		03/29/18 15:58	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/29/18 10:55	03/30/18 16:37	7429-90-5	
Barium, Dissolved	170	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:37	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:37	7440-50-8	
Manganese, Dissolved	719	ug/L	5.0	1	03/29/18 10:55	03/30/18 16:37	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:37	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:37	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/29/18 10:55	03/30/18 16:37	7440-31-5	
Total Hardness by 2340B, Dissolved	717000	ug/L	3300	1	03/29/18 10:55	03/30/18 16:37		
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:37	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-36-0	
Arsenic, Dissolved	0.66	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/18 09:42	03/28/18 14:53	7440-41-7	
Boron, Dissolved	1690	ug/L	25.0	5	03/28/18 09:42	03/28/18 14:56	7440-42-8	M1
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/18 09:42	03/28/18 14:53	7440-43-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium, Dissolved	0.56	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 14:53	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 14:53	7440-28-0	
Uranium-238, Dissolved	3.3	ug/L	0.50	1	03/28/18 09:42	03/28/18 14:53	7440-61-1	
Vanadium, Dissolved	1.7	ug/L	1.0	1	03/28/18 09:42	03/28/18 14:53	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/29/18 09:14	03/29/18 12:42	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	03/29/18 16:04	04/03/18 02:57		L2
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	83-32-9	
Anthracene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	120-12-7	
Benzo(a)pyrene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	50-32-8	
Benzoic acid	ND	ug/L	56.2	1	03/29/18 14:54	04/04/18 20:41	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	101-55-3	
Butylbenzylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	111-44-4	
2-Chlorophenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	56.2	1	03/29/18 14:54	04/04/18 20:41	91-94-1	
2,4-Dichlorophenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	120-83-2	
Diethylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	84-66-2	
2,4-Dimethylphenol	ND	ug/L	56.2	1	03/29/18 14:54	04/04/18 20:41	105-67-9	
Dimethylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	131-11-3	
Di-n-butylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	84-74-2	
2,4-Dinitrophenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	51-28-5	
Di-n-octylphthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	117-81-7	
Fluoranthene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	206-44-0	
Fluorene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	86-73-7	
Hexachlorobenzene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	56.2	1	03/29/18 14:54	04/04/18 20:41	77-47-4	
Hexachloroethane	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	67-72-1	
Isophorone	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	78-59-1	
2-Methylnaphthalene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	22.5	1	03/29/18 14:54	04/04/18 20:41		
N-Nitrosodiphenylamine	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	86-30-6	
Pentachlorophenol	ND	ug/L	22.5	1	03/29/18 14:54	04/04/18 20:41	87-86-5	
Phenanthrene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	85-01-8	
Phenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	108-95-2	
Pyrene	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5	Lab ID: 10424606001	Collected: 03/22/18 15:00	Received: 03/22/18 17:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
2,4,6-Trichlorophenol	ND	ug/L	11.2	1	03/29/18 14:54	04/04/18 20:41	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	85	%.	60-125	1	03/29/18 14:54	04/04/18 20:41	4165-60-0	
2-Fluorobiphenyl (S)	63	%.	56-125	1	03/29/18 14:54	04/04/18 20:41	321-60-8	
p-Terphenyl-d14 (S)	98	%.	58-125	1	03/29/18 14:54	04/04/18 20:41	1718-51-0	
Phenol-d6 (S)	96	%.	58-125	1	03/29/18 14:54	04/04/18 20:41	13127-88-3	
2-Fluorophenol (S)	87	%.	55-125	1	03/29/18 14:54	04/04/18 20:41	367-12-4	
2,4,6-Tribromophenol (S)	97	%.	65-125	1	03/29/18 14:54	04/04/18 20:41	118-79-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	2.3	mg/L	2.0	1	03/23/18 14:53	03/28/18 14:48		
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.6	1		03/29/18 12:52		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	5.0	NTU	0.30	1		03/23/18 13:50		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	10.0	mg/L	10.0	1		03/27/18 15:13		
4500ClO2 Chlorine Dioxide								
Analytical Method: SM 4500-ClO2								
Chlorine Dioxide	0.25	mg/L	0.10	1		04/06/18 13:42		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.0	Std. Units	0.10	1		03/27/18 14:29		H6
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	176	mg/L	6.0	5		03/31/18 08:34	16887-00-6	
Fluoride	0.16	mg/L	0.050	1		03/31/18 01:52	16984-48-8	
300.1 Oxihalide IC Anions 14d								
Analytical Method: EPA 300.1								
Chlorite	ND	ug/L	25.0	5		03/28/18 23:47		D3
300.1 Oxihalide IC Anions 28d								
Analytical Method: EPA 300.1								
Bromate	ND	ug/L	5.0	5		03/28/18 23:47	15541-45-4	D3
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/23/18 09:40		M3
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	2.0	mg/L	0.10	1	04/02/18 07:00	04/03/18 08:31	7664-41-7	M0
353.2 Nitrate + Nitrite								
Analytical Method: EPA 353.2								
Nitrate as N	ND	mg/L	0.020	1		03/23/18 11:41	14797-55-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sample: FD-SB-E5								
Lab ID: 10424606001								
Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Water								
353.2 Nitrate + Nitrite								
Analytical Method: EPA 353.2								
Nitrite as N	ND	mg/L	0.020	1		03/23/18 11:41	14797-65-0	
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/23/18 11:41		
9016 Cyanide, Free								
Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:04		
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	13.2	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:48	57-12-5	
SM4500P-E, Total Phosphorus								
Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B								
Phosphorus	ND	mg/L	0.050	1	04/09/18 09:22	04/09/18 13:26	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 436284	Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1	Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10424606001	

METHOD BLANK: 2369790 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Carbofuran	ug/L	ND	2.0	03/29/18 10:40	
Oxamyl	ug/L	ND	2.0	03/29/18 10:40	
BDMC (S)	%	93	80-120	03/29/18 10:40	

LABORATORY CONTROL SAMPLE: 2369791

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbofuran	ug/L	10	12.2	122	80-120	L1
Oxamyl	ug/L	10	9.8	98	80-120	
BDMC (S)	%			91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2369792 2369793

Parameter	Units	35381896001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Carbofuran	ug/L				10.3	11.0				7	20	
Oxamyl	ug/L				8.1	8.2				1	20	
BDMC (S)	%						96	84	80-120			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 436495 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10424606001

METHOD BLANK: 2370792 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	03/29/18 17:29	

LABORATORY CONTROL SAMPLE: 2370793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	45.7	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370794 2370795

Parameter	Units	35382120001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	43.8	45.2	88	90	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370796 2370797

Parameter	Units	10424606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	36.4	36.2	73	72	80-120	0	30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 435508	Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol	Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10424606001	

METHOD BLANK: 2011284 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/04/18 13:46	

LABORATORY CONTROL SAMPLE: 2011285

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	56.4	113	79-111	L3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011376 2011377

Parameter	Units	60266710003 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MS Result	% Rec	% Rec						
Methanol	mg/L	ND	50	50	46.8	46.4	94	93	43-138	1	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 435081 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10424606001

METHOD BLANK: 2009741 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/02/18 16:08	

LABORATORY CONTROL SAMPLE: 2009742

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	24.8	99	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009945 2009946

Parameter	Units	2009945		2009946		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Ethylene glycol	mg/L	ND	25	25	14.4	25.6	58	103	38-154	56	20 R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 19069

Analysis Method: EPA 8316

QC Batch Method: EPA 8316

Analysis Description: 8316 W GCSV Acrylamide

Associated Lab Samples: 10424606001

METHOD BLANK: 75864

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	03/29/18 15:20	

LABORATORY CONTROL SAMPLE: 75865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1030	103	80-120	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch:	529562	Analysis Method:	EPA 245.1
QC Batch Method:	EPA 245.1	Analysis Description:	245.1 Mercury - Dissolved
Associated Lab Samples:	10424606001		

METHOD BLANK: 2874494 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	03/29/18 12:36	

LABORATORY CONTROL SAMPLE & LCSD: 2874495 2874496

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.4	5.5	107	110	85-115	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529546	Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7	Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10424606001	

METHOD BLANK: 2874431 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	03/30/18 16:29	
Barium, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Copper, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Manganese, Dissolved	ug/L	ND	5.0	03/30/18 16:29	
Nickel, Dissolved	ug/L	ND	20.0	03/30/18 16:29	
Silver, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Tin, Dissolved	ug/L	ND	75.0	03/30/18 16:29	
Zinc, Dissolved	ug/L	ND	20.0	03/30/18 16:29	

LABORATORY CONTROL SAMPLE & LCSD: 2874432

2874433

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	20900	104	104	85-115	1	20	
Barium, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Copper, Dissolved	ug/L	1000	977	981	98	98	85-115	0	20	
Manganese, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Nickel, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Silver, Dissolved	ug/L	500	494	495	99	99	85-115	0	20	
Tin, Dissolved	ug/L	1000	983	981	98	98	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529354 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10424606001

METHOD BLANK: 2873346 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Arsenic, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Beryllium, Dissolved	ug/L	ND	0.20	03/28/18 14:47	
Boron, Dissolved	ug/L	ND	5.0	03/28/18 14:47	
Cadmium, Dissolved	ug/L	ND	0.080	03/28/18 14:47	
Chromium, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Cobalt, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Lead, Dissolved	ug/L	ND	0.10	03/28/18 14:47	
Selenium, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Thallium, Dissolved	ug/L	ND	0.10	03/28/18 14:47	
Uranium-238, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Vanadium, Dissolved	ug/L	ND	1.0	03/28/18 14:47	

LABORATORY CONTROL SAMPLE: 2873347

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	102	102	85-115	
Arsenic, Dissolved	ug/L	100	104	104	85-115	
Beryllium, Dissolved	ug/L	100	108	108	85-115	
Boron, Dissolved	ug/L	100	115	115	85-115	
Cadmium, Dissolved	ug/L	100	104	104	85-115	
Chromium, Dissolved	ug/L	100	108	108	85-115	
Cobalt, Dissolved	ug/L	100	105	105	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	105	105	85-115	
Thallium, Dissolved	ug/L	100	104	104	85-115	
Uranium-238, Dissolved	ug/L	100	109	109	85-115	
Vanadium, Dissolved	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873348 2873349

Parameter	Units	10424606001		2873348		2873349		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Antimony, Dissolved	ug/L	ND	100	100	110	112	110	112	70-130	2	20			
Arsenic, Dissolved	ug/L	0.66	100	100	110	114	110	113	70-130	3	20			
Beryllium, Dissolved	ug/L	ND	100	100	116	117	116	117	70-130	1	20			
Boron, Dissolved	ug/L	1690	100	100	1850	1870	153	176	70-130	1	20	M1		
Cadmium, Dissolved	ug/L	ND	100	100	108	111	108	111	70-130	2	20			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873348												2873349	
Parameter	Units	10424606001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Chromium, Dissolved	ug/L	0.56	100	100	113	115	112	115	70-130	2	20		
Cobalt, Dissolved	ug/L	ND	100	100	109	111	108	111	70-130	3	20		
Lead, Dissolved	ug/L	ND	100	100	109	113	109	113	70-130	3	20		
Selenium, Dissolved	ug/L	ND	100	100	107	108	107	108	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	109	112	109	112	70-130	3	20		
Uranium-238, Dissolved	ug/L	3.3	100	100	114	120	111	116	70-130	5	20		
Vanadium, Dissolved	ug/L	1.7	100	100	113	116	111	115	70-130	3	20		

MATRIX SPIKE SAMPLE: 2873350									
Parameter	Units	10425051001 Result	Spike	MS	MS	% Rec	Qualifiers		
			Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	111	111	70-130			
Arsenic, Dissolved	ug/L	ND	100	114	111	70-130			
Beryllium, Dissolved	ug/L	ND	100	117	117	70-130			
Boron, Dissolved	ug/L	245	100	344	99	70-130			
Cadmium, Dissolved	ug/L	ND	100	107	107	70-130			
Chromium, Dissolved	ug/L	ND	100	118	114	70-130			
Cobalt, Dissolved	ug/L	ND	100	108	108	70-130			
Lead, Dissolved	ug/L	ND	100	111	111	70-130			
Selenium, Dissolved	ug/L	ND	100	115	111	70-130			
Thallium, Dissolved	ug/L	ND	100	110	109	70-130			
Uranium-238, Dissolved	ug/L	5.1	100	118	113	70-130			
Vanadium, Dissolved	ug/L	ND	100	120	115	70-130			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 436264 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10424606001

METHOD BLANK: 2369618 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/02/18 22:58	

LABORATORY CONTROL SAMPLE: 2369619

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	9.6	19	80-120	L2

LABORATORY CONTROL SAMPLE: 2369620

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	8.8J	97	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370435 2370436

Parameter	Units	7046265001 Result	2370435		2370436		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Endothall	ug/L	<9.0	50	50	6.2J	5.1J	12	10	64-137		30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2370437 2370438

Parameter	Units	7046265002 Result	2370437		2370438		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Endothall	ug/L	<9.0	50	50	43.2	6.1J	86	12	64-137		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 435581 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10424606001

METHOD BLANK: 2366828 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	03/27/18 10:27	

LABORATORY CONTROL SAMPLE: 2366829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.5	77	70-130	

LABORATORY CONTROL SAMPLE: 2366830

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	.33J	83	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367284 2367285

Parameter	Units	35381489001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diquat	ug/L	<0.30	2	2	1.6	1.5	79	76	70-130	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2367286 2367287

Parameter	Units	35381489002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diquat	ug/L	<0.30	2	2	1.6	1.6	79	81	70-130	3	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 436904 Analysis Method: EPA 552.3
 QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
 Associated Lab Samples: 10424606001

METHOD BLANK: 2372587 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
Dichloroacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/02/18 22:41	
Monobromoacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
Monochloroacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
Trichloroacetic Acid	ug/L	ND	1.0	04/02/18 22:41	
2,3-Dibromopropanoic Acid (S)	%	95	70-130	04/02/18 22:41	

LABORATORY CONTROL SAMPLE: 2372588

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	9.7	97	70-130	
Dichloroacetic Acid	ug/L	10	8.8	88	70-130	
Haloacetic Acids (Total)	ug/L	50	46.7	93		
Monobromoacetic Acid	ug/L	10	9.0	90	70-130	
Monochloroacetic Acid	ug/L	10	9.5	95	70-130	
Trichloroacetic Acid	ug/L	10	9.8	98	70-130	
2,3-Dibromopropanoic Acid (S)	%			107	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2373050 2373051

Parameter	Units	35380905001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Dibromoacetic Acid	ug/L	0.96J	10	10	12.1	12.5	111	115	70-130	3	30		
Dichloroacetic Acid	ug/L	<0.24	10	10	9.9	10.1	99	101	70-130	2	30		
Haloacetic Acids (Total)	ug/L	0.96J	50	50	54.9	55.8	108	110		2	30		
Monobromoacetic Acid	ug/L	<0.29	10	10	11.2	11.2	112	112	70-130	0	30		
Monochloroacetic Acid	ug/L	<0.90	10	10	10.7	10.4	107	104	70-130	2	30		
Trichloroacetic Acid	ug/L	<0.26	10	10	11.0	11.5	110	115	70-130	4	30		
2,3-Dibromopropanoic Acid (S)	%						106	107	70-130		30		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2373052 2373053

Parameter	Units	35380908001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Dibromoacetic Acid	ug/L	<0.43	10	10	11.4	11.4	114	114	70-130	0	30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Parameter	Units	2373052		2373053		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		35380908001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dichloroacetic Acid	ug/L	<0.24	10	10	10.1	10.1	101	101	70-130	0	30	
Haloacetic Acids (Total)	ug/L	<0.67	50	50	54.0	53.9	108	108		0	30	
Monobromoacetic Acid	ug/L	<0.29	10	10	10.1	10.1	101	101	70-130	1	30	
Monochloroacetic Acid	ug/L	<0.90	10	10	10.8	10.8	108	108	70-130	0	30	
Trichloroacetic Acid	ug/L	<0.26	10	10	11.6	11.5	116	115	70-130	0	30	
2,3-Dibromopropanoic Acid (S)	%						103	101	70-130		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 529156 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10424606001

METHOD BLANK: 2872152 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/05/18 16:23	
4,4'-DDE	ug/L	ND	0.10	04/05/18 16:23	
4,4'-DDT	ug/L	ND	0.10	04/05/18 16:23	
Aldrin	ug/L	ND	0.050	04/05/18 16:23	
alpha-BHC	ug/L	ND	0.050	04/05/18 16:23	
alpha-Chlordane	ug/L	ND	0.050	04/05/18 16:23	
beta-BHC	ug/L	ND	0.050	04/05/18 16:23	
Chlordane (Technical)	ug/L	ND	0.50	04/05/18 16:23	
delta-BHC	ug/L	ND	0.050	04/05/18 16:23	
Dieldrin	ug/L	ND	0.10	04/05/18 16:23	
Endosulfan I	ug/L	ND	0.050	04/05/18 16:23	
Endosulfan II	ug/L	ND	0.10	04/05/18 16:23	
Endosulfan sulfate	ug/L	ND	0.10	04/05/18 16:23	
Endrin	ug/L	ND	0.10	04/05/18 16:23	
Endrin aldehyde	ug/L	ND	0.10	04/05/18 16:23	
Endrin ketone	ug/L	ND	0.10	04/05/18 16:23	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/05/18 16:23	
gamma-Chlordane	ug/L	ND	0.050	04/05/18 16:23	
Heptachlor	ug/L	ND	0.050	04/05/18 16:23	
Heptachlor epoxide	ug/L	ND	0.050	04/05/18 16:23	
Methoxychlor	ug/L	ND	0.50	04/05/18 16:23	
Toxaphene	ug/L	ND	1.5	04/05/18 16:23	
Decachlorobiphenyl (S)	%	92	30-143	04/05/18 16:23	
Tetrachloro-m-xylene (S)	%	93	62-125	04/05/18 16:23	

LABORATORY CONTROL SAMPLE & LCSD: 2872153

Parameter	Units	2872154							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	1.0	100	102	67-125	1	20		
4,4'-DDE	ug/L	1	0.97	0.99	97	99	68-125	1	20		
4,4'-DDT	ug/L	1	1.0	1.0	101	101	66-125	1	20		
Aldrin	ug/L	.5	0.43	0.43	87	86	46-125	1	20		
alpha-BHC	ug/L	.5	0.45	0.45	90	90	66-125	1	20		
alpha-Chlordane	ug/L	.5	0.47	0.47	94	94	72-125	0	20		
beta-BHC	ug/L	.5	0.47	0.47	94	94	72-125	0	20		
delta-BHC	ug/L	.5	0.30	0.30	59	60	37-141	1	20		
Dieldrin	ug/L	1	1.0	1.0	104	105	71-125	0	20		
Endosulfan I	ug/L	.5	0.45	0.44	89	89	69-125	0	20		
Endosulfan II	ug/L	1	1.0	1.0	102	102	73-125	0	20		
Endosulfan sulfate	ug/L	1	0.85	0.86	85	86	63-127	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Parameter	Units	2872153		2872154			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	0.96	0.97	96	97	72-125	1	20	
Endrin aldehyde	ug/L	1	0.96	0.97	96	97	70-125	2	20	
Endrin ketone	ug/L	1	1.0	1.1	105	106	72-127	1	20	
gamma-BHC (Lindane)	ug/L	.5	0.46	0.47	93	94	69-125	1	20	
gamma-Chlordane	ug/L	.5	0.42	0.42	84	84	64-125	0	20	
Heptachlor	ug/L	.5	0.47	0.46	94	93	54-125	2	20	
Heptachlor epoxide	ug/L	.5	0.47	0.47	95	94	72-125	0	20	
Methoxychlor	ug/L	5	5.0	5.1	100	102	67-127	2	20	
Decachlorobiphenyl (S)	%.				86	89	30-143			
Tetrachloro-m-xylene (S)	%.				90	90	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529157	Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C	Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10424606001	

METHOD BLANK: 2872155 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/03/18 12:39	
Decachlorobiphenyl (S)	%	91	30-125	04/03/18 12:39	
Tetrachloro-m-xylene (S)	%	67	30-125	04/03/18 12:39	

LABORATORY CONTROL SAMPLE & LCSD: 2872156

Parameter	Units	2872157								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.5	80	75	47-125	6	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.7	1.6	83	82	54-125	1	20	
Decachlorobiphenyl (S)	%				85	84	30-125			
Tetrachloro-m-xylene (S)	%				77	74	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 529677 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10424606001

METHOD BLANK: 2874915 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dimethylphenol	ug/L	ND	50.0	04/03/18 17:31	
2,4-Dinitrophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Chlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Methylnaphthalene	ug/L	ND	10.0	04/03/18 17:31	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/03/18 17:31	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/03/18 17:31	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/03/18 17:31	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/03/18 17:31	
Acenaphthene	ug/L	ND	10.0	04/03/18 17:31	
Anthracene	ug/L	ND	10.0	04/03/18 17:31	
Benzo(a)pyrene	ug/L	ND	10.0	04/03/18 17:31	
Benzoic acid	ug/L	ND	50.0	04/03/18 17:31	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/03/18 17:31	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/03/18 17:31	
Butylbenzylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-butylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-octylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Diethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Dimethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Fluoranthene	ug/L	ND	10.0	04/03/18 17:31	
Fluorene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorobenzene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/03/18 17:31	
Hexachloroethane	ug/L	ND	10.0	04/03/18 17:31	
Isophorone	ug/L	ND	10.0	04/03/18 17:31	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/03/18 17:31	
Pentachlorophenol	ug/L	ND	20.0	04/03/18 17:31	
Phenanthrene	ug/L	ND	10.0	04/03/18 17:31	
Phenol	ug/L	ND	10.0	04/03/18 17:31	
Pyrene	ug/L	ND	10.0	04/03/18 17:31	
2,4,6-Tribromophenol (S)	%	81	65-125	04/03/18 17:31	
2-Fluorobiphenyl (S)	%	74	56-125	04/03/18 17:31	
2-Fluorophenol (S)	%	83	55-125	04/03/18 17:31	
Nitrobenzene-d5 (S)	%	81	60-125	04/03/18 17:31	
p-Terphenyl-d14 (S)	%	107	58-125	04/03/18 17:31	
Phenol-d6 (S)	%	87	58-125	04/03/18 17:31	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

LABORATORY CONTROL SAMPLE & LCSD: 2874916		2874917								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	41.4	42.1	83	84	74-125	2	20	
2,4-Dichlorophenol	ug/L	50	39.2	39.7	78	79	68-125	1	20	
2,4-Dimethylphenol	ug/L	50	28.9J	31J	58	62	33-125		20	
2,4-Dinitrophenol	ug/L	50	34.2	36.8	68	74	30-127	7	20	
2-Chlorophenol	ug/L	50	38.3	37.2	77	74	61-125	3	20	
2-Methylnaphthalene	ug/L	50	38.0	38.8	76	78	67-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	36.4	35.0	73	70	63-125	4	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.3	36.8	75	74	67-125	1	20	
3,3'-Dichlorobenzidine	ug/L	50	45.7J	48.1J	91	96	60-125		20	
4-Bromophenylphenyl ether	ug/L	50	43.2	43.6	86	87	75-125	1	20	
Acenaphthene	ug/L	50	40.1	40.9	80	82	74-125	2	20	
Anthracene	ug/L	50	43.5	43.9	87	88	75-125	1	20	
Benzo(a)pyrene	ug/L	50	42.7	42.4	85	85	75-125	1	20	
Benzoic acid	ug/L	50	21.9J	22.1J	44	44	30-125		20	1M
bis(2-Chloroethyl) ether	ug/L	50	35.4	34.0	71	68	55-125	4	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.0	41.6	82	83	72-129	1	20	
Butylbenzylphthalate	ug/L	50	41.2	41.2	82	82	69-127	0	20	
Di-n-butylphthalate	ug/L	50	41.5	42.0	83	84	75-125	1	20	
Di-n-octylphthalate	ug/L	50	41.6	41.4	83	83	69-131	1	20	
Diethylphthalate	ug/L	50	42.5	43.0	85	86	75-125	1	20	
Dimethylphthalate	ug/L	50	42.6	43.0	85	86	75-125	1	20	
Fluoranthene	ug/L	50	42.6	44.2	85	88	75-125	4	20	
Fluorene	ug/L	50	41.7	42.4	83	85	75-125	2	20	
Hexachlorobenzene	ug/L	50	42.0	42.3	84	85	74-125	1	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	30	31	30-125		20	
Hexachloroethane	ug/L	50	28.9	26.6	58	53	30-125	9	20	
Isophorone	ug/L	50	37.8	38.4	76	77	72-125	2	20	
N-Nitrosodiphenylamine	ug/L	50	41.5	41.7	83	83	75-125	0	20	
Pentachlorophenol	ug/L	50	35.5	36.9	71	74	52-125	4	20	
Phenanthrene	ug/L	50	43.3	43.5	87	87	75-125	1	20	
Phenol	ug/L	50	38.0	36.7	76	73	59-125	3	20	
Pyrene	ug/L	50	44.1	44.3	88	89	75-125	0	20	
2,4,6-Tribromophenol (S)	%				90	92	65-125			
2-Fluorobiphenyl (S)	%				80	82	56-125			
2-Fluorophenol (S)	%				80	77	55-125			
Nitrobenzene-d5 (S)	%				76	77	60-125			
p-Terphenyl-d14 (S)	%				99	101	58-125			
Phenol-d6 (S)	%				82	81	58-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 18993	Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A	Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10424606001	

METHOD BLANK: 75621 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	03/30/18 11:19	

LABORATORY CONTROL SAMPLE: 75622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	403	101	44-176	

MATRIX SPIKE SAMPLE: 75623

Parameter	Units	40166480001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	1560	400	1620	17	35-167	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 528769	Analysis Method: Hach 10360 Rev 1.1
QC Batch Method: Hach 10360	Analysis Description: Hach 10360 Rev 1.1, BOD
Associated Lab Samples: 10424606001	

METHOD BLANK: 2869664 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	03/28/18 14:31	

LABORATORY CONTROL SAMPLE & LCSD: 2869666 2869822

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	198	198	208	100	105	85-115	5	20	

SAMPLE DUPLICATE: 2869667

Parameter	Units	10424571001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	177	252	35	20	D6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529575	Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG	Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10424606001	

METHOD BLANK: 2874530 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	03/29/18 09:21	

LABORATORY CONTROL SAMPLE: 2874531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	34.3	86	78-114	

MATRIX SPIKE SAMPLE: 2874532

Parameter	Units	10424522001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	40.4	30.7	72	78-114	M1

SAMPLE DUPLICATE: 2874533

Parameter	Units	10424970001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	ND	ND		18	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 528828	Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1	Analysis Description: 180.1 Turbidity
Associated Lab Samples: 10424606001	

METHOD BLANK: 2869996 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/23/18 13:43	

LABORATORY CONTROL SAMPLE: 2869997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.4	102	90-110	

SAMPLE DUPLICATE: 2869998

Parameter	Units	10424626001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	3.7	3.3	11	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch:	529277	Analysis Method:	SM 2540D
QC Batch Method:	SM 2540D	Analysis Description:	2540D Total Suspended Solids
Associated Lab Samples:	10424606001		

METHOD BLANK: 2872638 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/27/18 15:13	

LABORATORY CONTROL SAMPLE: 2872639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	82.0	82	80-120	

SAMPLE DUPLICATE: 2872640

Parameter	Units	10424927021 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	132	129	2	10	H3

SAMPLE DUPLICATE: 2872641

Parameter	Units	10424927022 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	49.0	50.0	2	10	H3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 438356	Analysis Method: SM 4500-CIO2
QC Batch Method: SM 4500-CIO2	Analysis Description: 4500CIO2 Chlorine Dioxide
Associated Lab Samples: 10424606001	

METHOD BLANK: 2380118 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/06/18 13:42	H6

LABORATORY CONTROL SAMPLE: 2380119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	94	90-110	H6

SAMPLE DUPLICATE: 2380120

Parameter	Units	10424606001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.25	0.25	0	20	H6

SAMPLE DUPLICATE: 2380121

Parameter	Units	7584977001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.95	0.96	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 529218 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10424606001

LABORATORY CONTROL SAMPLE: 2872361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	100	98-102	H6

SAMPLE DUPLICATE: 2872362

Parameter	Units	10424592001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.6	10.6	0	3	H6

SAMPLE DUPLICATE: 2872363

Parameter	Units	92378064001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.4	5.4	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10424606001

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	03/30/18 20:53	
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.6	93	90-110	
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	8.6	12.5	12.5	19.8	19.8	89	90	90-110	0	20	M1
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	156	62.5	62.5	207	207	81	81	90-110	0	20	M1
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 436295	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10424606001	

METHOD BLANK: 2369867 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	03/28/18 13:23	

LABORATORY CONTROL SAMPLE: 2369868

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	40.0	100	85-115	

MATRIX SPIKE SAMPLE: 2369870

Parameter	Units	60266407002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	4000	3870	97	75-125	

SAMPLE DUPLICATE: 2369869

Parameter	Units	60266407002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 436294	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10424606001	

METHOD BLANK: 2369861 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	03/28/18 13:23	

LABORATORY CONTROL SAMPLE: 2369862

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	7.6	95	85-115	

MATRIX SPIKE SAMPLE: 2369864

Parameter	Units	60266407002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	800	773	97	75-125	

SAMPLE DUPLICATE: 2369863

Parameter	Units	60266407002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 528739	Analysis Method: SM 3500-Cr D Modified
QC Batch Method: SM 3500-Cr D Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10424606001	

METHOD BLANK: 2869559 Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/23/18 09:10	

LABORATORY CONTROL SAMPLE: 2869560

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869561 2869562

Parameter	Units	10424606001		2869561		2869562		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Chromium, Hexavalent	mg/L	ND	.2	.2	.0031J	.0029J	1	1	85-115	20	M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 139700

Analysis Method: EPA 350.1 rev. 2 (1993)

QC Batch Method: EPA 350.1 rev. 2 (1993)

Analysis Description: 350.1 Ammonia Distilled

Associated Lab Samples: 10424606001

METHOD BLANK: 553300

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/03/18 08:30	

LABORATORY CONTROL SAMPLE: 553301

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10.3	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553302

553303

Parameter	Units	10424606001		553302		553303		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Nitrogen, Ammonia	mg/L	2.0	10	10	10	9.8	10.0	78	80	90-110	2	10 M0

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 528772	Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2	Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10424606001	

METHOD BLANK: 2869690 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/23/18 11:44	
Nitrite as N	mg/L	ND	0.020	03/23/18 11:44	
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/23/18 11:44	

LABORATORY CONTROL SAMPLE: 2869691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.98	98	90-110	
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2869692 2869693

Parameter	Units	10424606001		2869692		2869693		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Nitrite as N	mg/L	ND	1	1	0.93	0.94	93	94	90-110	1	20	
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.95	1.0	95	101	90-110	6	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 19623 Analysis Method: EPA 9016
 QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
 Associated Lab Samples: 10424606001

METHOD BLANK: 77969 Matrix: Water
 Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971 77972

Parameter	Units	10424606001		77971		77972		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Cyanide, Free	ug/L	ND	150	150	160	160	106	106	80-120	0	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 530296 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10424606001

METHOD BLANK: 2878424 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/03/18 12:40	

LABORATORY CONTROL SAMPLE: 2878425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	241	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878426 2878427

Parameter	Units	10423797004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	1.5 mg/L	250	250	1950	1840	172	128	80-120	6	30	H3,M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878428 2878429

Parameter	Units	10425152001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	38.4	250	250	269	268	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

QC Batch: 531266 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10424606001

METHOD BLANK: 2884792 Matrix: Water
Associated Lab Samples: 10424606001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/09/18 13:24	

LABORATORY CONTROL SAMPLE: 2884793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.1	110	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2884794 2884795

Parameter	Units	10426344001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result										
Phosphorus	mg/L	0.17	1	1	1.2	1.2	104	104	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2884796 2884797

Parameter	Units	10426048001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result										
Phosphorus	mg/L	3.8	1	1	4.7	4.7	90	90	80-120	0	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Sample: FD-SB-E5 **Lab ID: 10424606001** Collected: 03/22/18 15:00 Received: 03/22/18 17:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	3.06 ± 1.90 (2.97) C:NA T:NA	pCi/L	04/05/18 08:56	12587-46-1	
Gross Beta	EPA 900.0	5.90 ± 2.23 (3.40) C:NA T:NA	pCi/L	04/05/18 08:56	12587-47-2	
Radium-226	EPA 903.1	0.681 ± 0.580 (0.815) C:NA T:84%	pCi/L	04/11/18 20:47	13982-63-3	
Radium-228	EPA 904.0	0.937 ± 0.493 (0.908) C:71% T:83%	pCi/L	04/10/18 13:21	15262-20-1	
Total Radium	Total Radium Calculation	1.62 ± 1.07 (1.72)	pCi/L	04/17/18 13:46	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 293327

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10424606001

METHOD BLANK: 1435510

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.436 ± 0.363 (0.727) C:77% T:72%	pCi/L	04/10/18 13:21	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 293307	Analysis Method: EPA 900.0
QC Batch Method: EPA 900.0	Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 10424606001	

METHOD BLANK: 1435471	Matrix: Water
Associated Lab Samples: 10424606001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.025 ± 0.367 (1.14) C:NA T:NA	pCi/L	04/05/18 08:54	
Gross Beta	0.724 ± 0.848 (1.83) C:NA T:NA	pCi/L	04/05/18 08:54	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

QC Batch: 293579

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10424606001

METHOD BLANK: 1437154

Matrix: Water

Associated Lab Samples: 10424606001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.147 ± 0.352 (0.681) C:NA T:88%	pCi/L	04/11/18 20:17	

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10424606

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 19125

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

BATCH QUALIFIERS

Batch: 529575

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 530078

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530399

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530440

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

- 1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Waters
Pace Project No.: 10424606

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424606001	FD-SB-E5	EPA 531.1	436284		
10424606001	FD-SB-E5	EPA 547	436495		
10424606001	FD-SB-E5	EPA 549.2	435581	EPA 549.2	435759
10424606001	FD-SB-E5	EPA 552.3	436904	EPA 552.3	437225
10424606001	FD-SB-E5	EPA 8015 Alcohol-Glycol	435508		
10424606001	FD-SB-E5	EPA 8015 Alcohol-Glycol	435081		
10424606001	FD-SB-E5	EPA Mod. 3510C	529156	EPA 8081B	530399
10424606001	FD-SB-E5	EPA Mod. 3510C	529157	EPA 8082A	530078
10424606001	FD-SB-E5	EPA 8315A	18993	EPA 8315A	19125
10424606001	FD-SB-E5	EPA 8316	19069		
10424606001	FD-SB-E5	EPA 200.7	529546	EPA 200.7	529681
10424606001	FD-SB-E5	EPA 200.8	529354	EPA 200.8	529496
10424606001	FD-SB-E5	EPA 245.1	529562	EPA 245.1	529636
10424606001	FD-SB-E5	EPA 548.1	436264	EPA 548.1	436842
10424606001	FD-SB-E5	EPA 3520	529677	EPA 8270D	530440
10424606001	FD-SB-E5	EPA 900.0	293307		
10424606001	FD-SB-E5	EPA 903.1	293579		
10424606001	FD-SB-E5	EPA 904.0	293327		
10424606001	FD-SB-E5	Total Radium Calculation	294961		
10424606001	FD-SB-E5	Hach 10360	528769	Hach 10360 Rev 1.1	528875
10424606001	FD-SB-E5	EPA 1664A OG	529575		
10424606001	FD-SB-E5	EPA 180.1	528828		
10424606001	FD-SB-E5	SM 2540D	529277		
10424606001	FD-SB-E5	SM 4500-CIO2	438356		
10424606001	FD-SB-E5	SM 4500-H+B	529218		
10424606001	FD-SB-E5	EPA 300.0	529627		
10424606001	FD-SB-E5	EPA 300.1	436295		
10424606001	FD-SB-E5	EPA 300.1	436294		
10424606001	FD-SB-E5	SM 3500-Cr D Modified	528739		
10424606001	FD-SB-E5	EPA 350.1 rev. 2 (1993)	139700	EPA 350.1 rev. 2 (1993)	139774
10424606001	FD-SB-E5	EPA 353.2	528772		
10424606001	FD-SB-E5	EPA 9016	19623	EPA 9016	19643
10424606001	FD-SB-E5	SM 4500-CN-E	530296	SM 4500-CN-E	530376

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Waters

Pace Project No.: 10424606

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424606001	FD-SB-E5	SM 4500-P B	531266	SM 4500-P E	531337

REPORT OF LABORATORY ANALYSIS

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LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved Metals per 3/19/18 M. W. P. L.	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500ClO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Sample Condition Upon Receipt

Client Name: Pace-Field

Project #:

WO# : 10424606
 PM: BM2 Due Date: 04/06/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 4.5/5.6 Cooler Temp Corrected (°C): 8.8/4.7 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 20.2 Date and Initials of Person Examining Contents: 3/22/18 JP

USDA Regulated Soil N/A, water sample
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <u>3/22/18 JP</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <u>3/22/18 JP</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <u>JP</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <u>WT</u> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>Notice on samples</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: BA N Date: 3/27/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

WO#: 12106409



12106409

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

Workorder: 10424606 Workorder Name: 18-00383 MPCA FreewayLF Waters Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis															
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																				
							Preserved Containers															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4				Nitrogen, unionized ammonia, as N							LAB USE ONLY					
1	FD-SB-E5	PS	3/22/2018 15:00	10424606001	Water	1				X												
2																						
3																						
4																						
5																						
Transfers										Comments												
Released By	Date/Time	Received By	Date/Time																			
<i>Henry J. Pace</i>	<i>3/27/18 1800</i>	<i>CB</i>	<i>3/22/18 1845</i>																			
<i>CB</i>	<i>3/27/18 2230</i>	<i>Ayl</i>	<i>3/28/18 1115</i>																			
Cooler Temperature on Receipt <i>4.0</i> °C		Custody Seal Y or N		Received on Ice Y or N		Samples Intact Y or N																

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace - Mpls.

Project #: **WO#: 12106409**
 PM: HRZ Due Date: 04/11/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 3/27/18 CPB

Comments: CPB 3/28/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____

Heather ZTD

Date: 3/28/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193171 **Date/Time and Initials of person examining contents:** 3/28/18 1415 DJ

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 7405

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 0.8/1.0 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):		/	
Containers Intact?:			Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:		/	

Comments:



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

(SCUR)

WO# : 35381955

Project #
Project Manager:
Client:

PM: ADC Due Date: 04/06/18
CLIENT: PACMIN

Date and Initials of person:
Examining contents: _____
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T315 Date: 3/24/18 Time: 1118 Initials: ALP

State of Origin: _____

Cooler #1 Temp. °C <u>1.3</u> (Visual) <u>1.0</u> (Correction Factor) <u>2.3</u> (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority

Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 0957

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (if Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<p>Preservation Information:</p> <p>Preservative: _____</p> <p>Lot #/Trace #: _____</p> <p>Date: _____ Time: _____</p> <p>Initials: _____</p>
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
All Containers needing preservation are found to be in compliance with EPA recommendation:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Exceptions: VOA, Coliform, TOC, O&G, Carbamates		
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: _____

Date: _____

WO#: 35381955

Chain of Custody



35381955



Samples were sent

State Of Origin: MN

Workorder: 10424606

Workorder Name: 18-00383 MPCA FreewayLF Waters

Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To						Requested Analysis																															
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668																																					
								<table border="1"> <thead> <tr> <th colspan="3">Preserved Containers</th> <th rowspan="2">Aldicarb/Carbofuran, Method 531.1</th> <th rowspan="2">Bromate/Chlorite EPA 300.1</th> <th rowspan="2">Chlorine dioxide SM4500ClO2</th> <th rowspan="2">Glyphosate EPA 547</th> <th rowspan="2">Haloacetic acids, total (HAA5) EPA</th> <th colspan="4">LAB USE ONLY</th> </tr> <tr> <th>Other</th> <th>Unpreserved</th> <th>N425203</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> </table>										Preserved Containers			Aldicarb/Carbofuran, Method 531.1	Bromate/Chlorite EPA 300.1	Chlorine dioxide SM4500ClO2	Glyphosate EPA 547	Haloacetic acids, total (HAA5) EPA	LAB USE ONLY				Other	Unpreserved	N425203							
Preserved Containers			Aldicarb/Carbofuran, Method 531.1	Bromate/Chlorite EPA 300.1	Chlorine dioxide SM4500ClO2	Glyphosate EPA 547	Haloacetic acids, total (HAA5) EPA	LAB USE ONLY																															
Other	Unpreserved	N425203																																					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	Unpreserved	N425203																															
1	FD-SB-E5	PS	3/22/2018 15:00	10424606001	Water	2	3	2					X	X	X	X	X	X																					
2																																							
3																																							
4																																							
5																																							

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	3/22/18	<i>[Signature]</i>	3/20/18 11:30						

Cooler Temperature on Receipt 3.1 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

NO#: 35381955

Project #
Project Manager:
Client:

PM: ADC **Due Date: 04/06/18**
CLIENT: PACMIN

Date and Initials of person:

Examining contents: _____
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T315 Date: 3/28/18 Time: 1130 Initials: AKP

State of Origin: _____

Cooler #1 Temp. °C <u>2.1</u> (Visual) <u>+1.0</u> (Correction Factor) <u>3.1</u> (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)	<input type="checkbox"/> Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 7449

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<p align="center">Preservation Information:</p> Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: _____ Date: _____

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424606 Workorder Name: 18-00383 MPCA FreewayLF Waters Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis						
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600					WO#: 30247544 						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	Preserved Containers				LAB USE ONLY <i>027</i>		
1	FD-SB-E5	PS	3/22/2018 15:00	10424606001	Water	2							
2													
3													
4													
5													
Transfers	Released By	Date/Time	Received By	Date/Time	Comments								
1	<i>[Signature]</i>	<i>3/22/18</i>	<i>[Signature]</i>	<i>3/28/18</i>	<i>1010</i>								
2													
3													
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact							
N/A °C		Y or N		Y or N		Y or N							

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace MN

Project # 30247544

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 74759831747

Label <u>PH</u>
LIMS Login

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D1071</u>	<u>PH 3/28/18</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>PH</u>	
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>PH</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PH</u>	Date: <u>3/28/18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody

WO#: 469989



Samples were sent direct

State Of Origin: MN

Workorder: 10424606 Workorder Name: 18-00383 MPCA FreewayLF Waters

Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis																														
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Grand Rapids 5560 Corporate Exchange Court Grand Rapids, MI 49512 USA Phone (616)975-4500					<table border="1"> <tr> <td>Acrylamide EPA 8316 PDFW</td> <td>Formaldehyde EPA 8315 PGRM</td> <td>Free Cyanide Method 9016</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>										Acrylamide EPA 8316 PDFW	Formaldehyde EPA 8315 PGRM	Free Cyanide Method 9016																		
Acrylamide EPA 8316 PDFW	Formaldehyde EPA 8315 PGRM	Free Cyanide Method 9016																																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Other	Unpreserved											LAB USE ONLY															
1	FD-SB-E5	PS	3/22/2018 15:00	10424606001	Water	2	5																														
2																																					
3																																					
4																																					
5																																					
Transfers		Released By	Date/Time	Received By		Date/Time		Comments																													
1		<i>Mary Kay Pace</i>	3/27/18 1620	<i>[Signature]</i>		3/28/18 0730																															
2																																					
3																																					
Cooler Temperature on Receipt		°C	Custody Seal Y or N		Received on Ice Y or N		Samples Intact Y or N																														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client Pace Mmesok	Work Order #: 469989
Receipt Record Page/Line # 17-5	Project Chemist / Sample #s

Recorded by (initials/date) PS 3/28/18	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received 1	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> See Additional Cooler Information Form <input type="checkbox"/> Other (# _____)
--	--	--------------------------	--

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time				
Real	1017										
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact					
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None					
Coolant Location: <input checked="" type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom					
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative					
	Observed °C	Correction Factor °C	Actual °C		Observed °C	Correction Factor °C	Actual °C				
Temp Blank:				Temp Blank:							
Sample 1:	1.1		1.1	Sample 1:							
Sample 2:	1.8		1.8	Sample 2:							
Sample 3:	3.0		3.0	Sample 3:							
3 Sample Average °C: _____				3 Sample Average °C: _____				3 Sample Average °C: _____			
<input type="checkbox"/> Cooler ID on COC?				<input type="checkbox"/> Cooler ID on COC?				<input type="checkbox"/> Cooler ID on COC?			
<input type="checkbox"/> VOC Trip Blank received?				<input type="checkbox"/> VOC Trip Blank received?				<input type="checkbox"/> VOC Trip Blank received?			

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received Yes No <input checked="" type="checkbox"/> Chain of Custody record(s)? If No, Initiated By _____ Received for Lab Signed/Date/Time? <input type="checkbox"/> Shipping document? <input checked="" type="checkbox"/> Other _____	Check Sample Preservation N/A Yes No <input checked="" type="checkbox"/> Temperature Blank OR average sample temperature, ≥6° C? <input type="checkbox"/> If either is ≥6° C, was thermal preservation required? If "Yes", Project Chemist Approval Initials: _____ If "Yes" Completed Non Con Cooler - Cont Inventory Form? <input type="checkbox"/> Completed Sample Preservation Verification Form? <input checked="" type="checkbox"/> Samples chemically preserved correctly? If "No", added orange tag? <input checked="" type="checkbox"/> Received pre-preserved VOC soils? <input type="checkbox"/> MeOH <input type="checkbox"/> Na ₂ SO ₄						
COC Information <input checked="" type="checkbox"/> Pace COC <input type="checkbox"/> Other _____ COC ID Numbers: 19261	Check for Short Hold-Time Prep/Analyses <input type="checkbox"/> Bacteriological <input type="checkbox"/> Air Bags <input type="checkbox"/> EnCores / Methanol Pre-Preserved <input checked="" type="checkbox"/> Formaldehyde/Aldehyde <input type="checkbox"/> Green-tagged containers <input type="checkbox"/> Yellow/White-tagged 1 L ambers (SV Prep-Lab)						
Check COC for Accuracy Yes No <input checked="" type="checkbox"/> Analysis Requested? <input checked="" type="checkbox"/> Sample ID matches COC? <input checked="" type="checkbox"/> Sample Date and Time matches COC? <input checked="" type="checkbox"/> Container type completed on COC? <input checked="" type="checkbox"/> All container types indicated are received?	Notes <input type="checkbox"/> Trip Blank received <input type="checkbox"/> Trip Blank not listed on COC <table border="1"> <tr> <td>Cooler Received (Date/Time)</td> <td>Paperwork Delivered (Date/Time)</td> <td>≤1 Hour Goal Met?</td> </tr> <tr> <td>PS 3/28/18</td> <td>PS 3/28/18</td> <td>Yes / No</td> </tr> </table>	Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?	PS 3/28/18	PS 3/28/18	Yes / No
Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?					
PS 3/28/18	PS 3/28/18	Yes / No					
Sample Condition Summary N/A Yes No <input checked="" type="checkbox"/> Broken containers/lids? <input checked="" type="checkbox"/> Missing or incomplete labels? <input checked="" type="checkbox"/> Illegible information on labels? <input checked="" type="checkbox"/> Low volume received? <input checked="" type="checkbox"/> Inappropriate or non-Pace containers received? <input type="checkbox"/> VOC vials / TOX containers have headspace? <input checked="" type="checkbox"/> Extra sample locations / containers not listed on COC?							

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: <u>Pace - Minnesota</u>	Work Order #: <u>469989</u>
Receipt Log #: <u>17-S</u>	Completed By (initials/date): <u>TS 3/28/18</u>
Project Manager: _____	

COC ID #: <u>19261</u>											Adjusted by: _____	
											Date: _____	
Container Type	5 (23)		4		13		6		15			
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2			
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1	✓	NA										
COC Line #2												
COC Line #3												
COC Line #4												
COC Line #5												
COC Line #6												
COC Line #7												
COC Line #8												
COC Line #9												
COC Line #10												
COC Line #11												
COC Line #12												

pH Strip Reagent or Lot #

HC727135

Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID #											Adjusted by: _____	
											Date: _____	
Container Type	5 / 23		4		13		6		15			
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2			
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1												
COC Line #2												
COC Line #3												
COC Line #4												
COC Line #5												
COC Line #6												
COC Line #7												
COC Line #8												
COC Line #9												
COC Line #10												
COC Line #11												
COC Line #12												

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____

Chain of Custody

A181311



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10424606 Workorder Name: 18-00383 MPCA FreewayLF Waters Owner Received Date: 3/22/2018 Results Requested By: 4/6/2018

Report To		Subcontract To					Requested Analysis																	
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																						
							Preserved Containers																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved						Herbicides MDA List II EPA 8151		Pesticides MDA List I (8270 pest)										LAB USE ONLY
1	FD-SB-E5	PS	3/22/2018 15:00	10424606001	Water	2						X	X									01		
2																								
3																								
4																								
5																								
												Comments												
Transfers	Released By	Date/Time	Received By	Date/Time																				
1	<i>Guy K... Pace</i>	3/27/18 16:12	<i>Kari-An... Kelly</i>	3/28/18																				
2				10:50																				
3																								
Cooler Temperature on Receipt		1.1 °C	Custody Seal		(Y) or N	Received on Ice		(Y) or N	Samples Intact										(Y) or N					

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 7/12/18



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 04, 2018

Bob Michels
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/28/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10424606
Project Manager: Bob Michels

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-SB-E5 (10424606001)	A181311-01	Water	03/22/2018	03/28/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 03/28/2018. Sample was received at 1.1 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for 2,4,5-TP, bentazon, dicamba, MCPA and triclopyr for sample A181311-01. Sample was less than the reporting limit for this analyte so no further action is required.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424606
 Project Manager: Bob Michels

FD-SB-E5 (10424606001)

Date Sampled

A181311-01 (Water)

03/22/2018 15:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
---------	--------	-----------------	-------	----------	----------	----------	--------	------------

Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A803161

Acetochlor	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
EPTC	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Phorate	ND	0.30	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Prometon	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Propazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Simazine	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Triallate	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	03/28/2018	03/29/2018 14:59	EPA 8270D	

Surrogate: Atrazine-d5		87.4 %		65.1-122	03/28/2018	03/29/2018 14:59	EPA 8270D	
Surrogate: Parathion-d10		125 %		22.3-159	03/28/2018	03/29/2018 14:59	EPA 8270D	
Surrogate: Triphenyl phosphate		126 %		65.2-151	03/28/2018	03/29/2018 14:59	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A803163

2,4-D	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
MCPA	ND	0.30	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
Picloram	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	03/29/2018	03/30/2018 20:07	EPA 8151A	

Surrogate: 2,4-D-d5		109 %		44.2-121	03/29/2018	03/30/2018 20:07	EPA 8151A	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424606
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803161 - EPA 3510C

Blank (A803161-BLK1)

Prepared: 03/28/2018 Analyzed: 03/29/2018 14:30

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.0</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.511</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.6</i>	<i>65.2-151</i>			

LCS (A803161-BS1)

Prepared: 03/28/2018 Analyzed: 03/29/2018 15:55

Acetochlor	0.951	0.50	ug/L	1.000		95.1	67.5-120			
Alachlor	0.935	0.50	ug/L	1.000		93.5	71.7-120			
Atrazine	0.935	0.50	ug/L	1.000		93.5	72.8-113			
Chlorpyrifos	0.958	0.50	ug/L	1.000		95.8	65.3-119			
Cyanazine	1.00	0.20	ug/L	1.000		100	49.5-140			
Desethylatrazine	0.924	0.50	ug/L	1.000		92.4	66.9-116			
Deisopropylatrazine	0.798	0.50	ug/L	1.000		79.8	44.3-110			
Dimethenamid	0.954	0.50	ug/L	1.000		95.4	63.8-116			
EPTC	0.789	0.50	ug/L	1.000		78.9	41.7-102			
Ethalfuralin	0.926	0.50	ug/L	1.000		92.6	41-127			
Fonofos	0.968	0.50	ug/L	1.000		96.8	59.7-118			
Metolachlor	0.996	0.50	ug/L	1.000		99.6	71.7-122			
Metribuzin	0.942	0.50	ug/L	1.000		94.2	66.6-128			
Pendimethalin	0.876	0.50	ug/L	1.000		87.6	55.5-137			
Phorate	0.737	0.30	ug/L	1.000		73.7	41.2-114			
Prometon	0.984	0.50	ug/L	1.000		98.4	66.3-120			
Propachlor	1.02	0.50	ug/L	1.000		102	65.8-119			



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 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10424606
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803161 - EPA 3510C

LCS (A803161-BS1)

Prepared: 03/28/2018 Analyzed: 03/29/2018 15:55

Propazine	0.958	0.50	ug/L	1.000		95.8	72-122			
Simazine	0.961	0.50	ug/L	1.000		96.1	72.8-113			
Terbufos	0.729	0.20	ug/L	1.000		72.9	38.6-115			
Triallate	0.945	0.50	ug/L	1.000		94.5	51.4-116			
Trifluralin	0.849	0.50	ug/L	1.000		84.9	46.1-134			
Surrogate: Atrazine-d5	0.454		ug/L	0.5000		90.8	65.1-122			
Surrogate: Parathion-d10	0.577		ug/L	0.5000		115	22.3-159			
Surrogate: Triphenyl phosphate	0.507		ug/L	0.5000		101	65.2-151			

LCS Dup (A803161-BS1)

Prepared: 03/28/2018 Analyzed: 03/29/2018 16:23

Acetochlor	0.998	0.50	ug/L	1.000		99.8	67.5-120	4.84	20	
Alachlor	0.986	0.50	ug/L	1.000		98.6	71.7-120	5.26	20	
Atrazine	0.985	0.50	ug/L	1.000		98.5	72.8-113	5.11	20	
Chlorpyrifos	1.01	0.50	ug/L	1.000		101	65.3-119	5.51	20	
Cyanazine	1.04	0.20	ug/L	1.000		104	49.5-140	4.32	20	
Desethylatrazine	0.984	0.50	ug/L	1.000		98.4	66.9-116	6.22	20	
Deisopropylatrazine	0.879	0.50	ug/L	1.000		87.9	44.3-110	9.63	20	
Dimethenamid	0.990	0.50	ug/L	1.000		99.0	63.8-116	3.78	20	
EPTC	0.837	0.50	ug/L	1.000		83.7	41.7-102	5.97	20	
Ethalfluralin	1.11	0.50	ug/L	1.000		111	41-127	18.4	20	
Fonofos	1.17	0.50	ug/L	1.000		117	59.7-118	18.9	20	
Metolachlor	1.03	0.50	ug/L	1.000		103	71.7-122	3.59	20	
Metribuzin	0.975	0.50	ug/L	1.000		97.5	66.6-128	3.48	20	
Pendimethalin	0.932	0.50	ug/L	1.000		93.2	55.5-137	6.25	20	
Phorate	0.722	0.30	ug/L	1.000		72.2	41.2-114	2.06	20	
Prometon	1.02	0.50	ug/L	1.000		102	66.3-120	3.16	20	
Propachlor	1.02	0.50	ug/L	1.000		102	65.8-119	0.397	20	
Propazine	0.976	0.50	ug/L	1.000		97.6	72-122	1.86	20	
Simazine	1.00	0.50	ug/L	1.000		100	72.8-113	4.37	20	
Terbufos	0.713	0.20	ug/L	1.000		71.3	38.6-115	2.29	20	
Triallate	1.14	0.50	ug/L	1.000		114	51.4-116	18.8	20	
Trifluralin	0.857	0.50	ug/L	1.000		85.7	46.1-134	0.979	20	
Surrogate: Atrazine-d5	0.432		ug/L	0.5000		86.4	65.1-122			
Surrogate: Parathion-d10	0.646		ug/L	0.5000		129	22.3-159			
Surrogate: Triphenyl phosphate	0.491		ug/L	0.5000		98.1	65.2-151			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10424606
Project Manager: Bob Michels

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A803163 - EPA 3510C

Blank (A803163-BLK1)

Prepared: 03/29/2018 Analyzed: 03/30/2018 11:52

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.18 ug/L 2.016 108 44.2-121

LCS (A803163-BS1)

Prepared: 03/29/2018 Analyzed: 03/30/2018 12:27

2,4-D	2.64	0.50	ug/L	2.000		132	64.6-148			
2,4-DB	2.62	0.50	ug/L	2.000		131	66.7-143			
2,4,5-T	2.34	0.50	ug/L	2.000		117	63.4-133			
2,4,5-TP (Silvex)	2.77	0.50	ug/L	2.000		139	63-145			
Bentazon	1.24	0.50	ug/L	1.000		124	52.5-139			
Dicamba	2.65	0.50	ug/L	2.000		132	55.4-143			
MCPA	2.57	0.30	ug/L	2.000		129	33.5-143			
Picloram	1.01	0.50	ug/L	1.000		101	47.9-113			
Triclopyr	2.66	0.50	ug/L	2.000		133	65.1-141			

Surrogate: 2,4-D-d5

2.06 ug/L 2.016 102 44.2-121

LCS Dup (A803163-BSD1)

Prepared: 03/29/2018 Analyzed: 03/30/2018 13:01

2,4-D	2.61	0.50	ug/L	2.000		130	64.6-148	1.32	20	
2,4-DB	2.67	0.50	ug/L	2.000		133	66.7-143	1.69	20	
2,4,5-T	2.43	0.50	ug/L	2.000		121	63.4-133	3.68	20	
2,4,5-TP (Silvex)	2.68	0.50	ug/L	2.000		134	63-145	3.57	20	
Bentazon	1.24	0.50	ug/L	1.000		124	52.5-139	0.330	20	
Dicamba	2.48	0.50	ug/L	2.000		124	55.4-143	6.66	20	
MCPA	2.51	0.30	ug/L	2.000		126	33.5-143	2.32	20	
Picloram	1.03	0.50	ug/L	1.000		103	47.9-113	1.93	20	
Triclopyr	2.61	0.50	ug/L	2.000		131	65.1-141	1.60	20	

Surrogate: 2,4-D-d5

1.98 ug/L 2.016 98.0 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10424606
Project Manager: Bob Michels

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

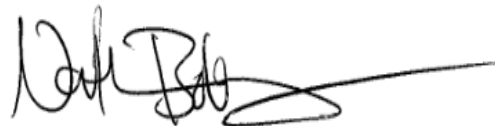
Pace Project #: 10424608
Sample Receipt Date: 03/22/2018
Client Project #: MPCA Freeway LF Wat
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 04, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 2, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 75%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 98-99% with a relative percent difference of 1.0%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10424608



10424608



Chain-of-Custody Form

Work Order Number:

Turnaround Time:

COC ID:

LABORATORY

FOR LAB USE ONLY

Facility Code: *MPCA Freeway LF water* Program Code (MDH Lab Only):

Lab Name:

Project Name: *MPCA Freeway LF water* Project Task Code:

Address: *18-00383*

Project Manager: Potential Hazard? If yes, add information to Sampler Comments Section

Phone No: *EPIC Profile # 38716*

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wtr-Ground=Groundwater
 Wtr-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	ANALYSIS REQUESTED										Lab Sample No.	#		
														1	2	3	4	5	6	7	8	9	10				
<i>FD-5B-E5</i>	<i>S</i>	<i>3/22/18</i>	<i>1700</i>			<i>G</i>	<i>NW</i>	<i>Wtr-Ground</i>	<i>N</i>		<i>33</i>	<i>X</i>	<i>X</i>													<i>001</i>	<i>1</i>
																											<i>2</i>
																											<i>3</i>
																											<i>4</i>
																											<i>5</i>
																											<i>6</i>
																											<i>7</i>
																											<i>8</i>
																											<i>9</i>
																											<i>10</i>

Sampled By: *David Anderson*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>David Anderson / PACE</i>	<i>3/22/18 / 1730</i>	<i>[Signature] - PACE</i>	<i>3-22-18 1740</i>

T=88, 4.7

Sample Condition Upon Receipt

Client Name: Pace-Field Project #: _____

WO#: 10424608

PM: SCU Due Date: 04/13/18
CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: _____ Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 7.5/9.6 Cooler Temp Corrected (°C): 8.8/4.7 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: 3/22/18 JP

USDA Regulated Soil N/A, water sample
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>Notime on samples</u>
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Sample # <u>13/3</u> <u>11/1</u> <u>11/1</u>
Headspace in VOA Vials (>5mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: Received during cool down process.

Project Manager Review: [Signature]

Date: 03/23/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved Metals per 3/19/18 m-umo	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

*- * Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-E5		
Lab Sample ID	10424608001		
Filename	Y180330B_06		
Injected By	BAL		
Total Amount Extracted	945 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/22/2018 15:00
ICAL ID	Y180204	Received	03/22/2018 17:40
CCal Filename(s)	Y180330B_01	Extracted	03/23/2018 11:45
Method Blank ID	BLANK-61282	Analyzed	03/30/2018 17:24

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	75
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	80

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61282	Matrix	Water
Filename	U180329A_19	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 16:30
CCal Filename(s)	U180329A_06	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	79
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	98

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61283	Matrix	Water
Filename	U180329A_20	Dilution	NA
Total Amount Extracted	949 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 17:12
CCal Filename	U180329A_06	Injected By	SMT
Method Blank ID	BLANK-61282		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.8	7.3	14.6	98
2,3,7,8-TCDD-37Cl4	10	8.3	3.7	15.8	83
2,3,7,8-TCDD-13C	100	77	25.0	141.0	77

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61284	Matrix	Water
Filename	U180329A_21	Dilution	NA
Total Amount Extracted	983 mL	Extracted	03/23/2018 11:45
ICAL ID	U171222	Analyzed	03/29/2018 17:55
CCal Filename	U180329A_06	Injected By	SMT
Method Blank ID	BLANK-61282		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.9	7.3	14.6	99
2,3,7,8-TCDD-37Cl4	10	8.5	3.7	15.8	85
2,3,7,8-TCDD-13C	100	77	25.0	141.0	77

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61283
 Spike 1 Filename U180329A_20

Spike 2 ID LCSD-61284
 Spike 2 Filename U180329A_21

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	98	99	1.0

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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April 12, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 23, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Unionized Ammonia was not calculated for sample FD-SB-B4 due to insufficient volume to conduct the field pH & Temperature

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512
Minnesota Department of Health, Certificate #1385941
Arkansas Department of Environmental Quality, Certificate #17-046-0
Georgia Environmental Protection Division, Stipulation
Illinois Environmental Protection Agency, Certificate #004325
Michigan Department of Environmental Quality, Laboratory #0034

New York State Department of Health, Serial #56192 and 56193
North Carolina Division of Water Resources, Certificate #659
Virginia Department of General Services, Certificate #9028
Wisconsin Department of Natural Resources, Laboratory #999472650
U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424766001	FD-SB-B4	Water	03/23/18 15:00	03/23/18 16:00
10424766002	FD-SB-D4	Water	03/23/18 15:30	03/23/18 16:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424766001	FD-SB-B4	EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	PW1	1	PASI-M
		Hach 10360 Rev 1.1	DCL	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		SM 4500-P E	DCL	1	PASI-M
		10424766002	FD-SB-D4	EPA 8081B	XV1
EPA 8082A	RAG			11	PASI-M
EPA 200.7	DM			8	PASI-M
EPA 200.8	TT3			2	PASI-M
EPA 200.8	TT3			12	PASI-M
EPA 245.1	PW1			1	PASI-M
EPA 8270D	JRH			38	PASI-M
	HRZ			2	PASI-V
Hach 10360 Rev 1.1	DCL			1	PASI-M
EPA 1664A OG	AR3			1	PASI-M
EPA 180.1	JFP			1	PASI-M
SM 2540D	NAS			1	PASI-M
SM 4500-H+B	JFP			1	PASI-M
Trivalent Chromium Calculation	KEO			1	PASI-M
EPA 300.0	KEO			1	PASI-M
SM 3500-Cr D Modified	JFP			1	PASI-M
EPA 350.1	HRZ			1	PASI-V
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V
EPA 353.2	JFP			3	PASI-M
EPA 9016	AMM			1	PASI-GRMI
SM 4500-CN-E	DCL	1	PASI-M		
SM 4500-P E	DCL	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Sample: FD-SB-B4	Lab ID: 10424766001	Collected: 03/23/18 15:00	Received: 03/23/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/29/18 10:55	03/30/18 16:40	7429-90-5	
Barium, Dissolved	490	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:40	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:40	7440-50-8	
Manganese, Dissolved	1300	ug/L	5.0	1	03/29/18 10:55	03/30/18 16:40	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:40	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:40	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/29/18 10:55	03/30/18 16:40	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:40	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	20.0	ug/L	2.5	5	03/28/18 10:49	03/29/18 00:12	7440-47-3	
Total Hardness by 2340B	1100000	ug/L	14100	100	03/28/18 10:49	03/29/18 00:15		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.7	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-36-0	
Arsenic, Dissolved	3.5	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/18 09:42	03/28/18 15:21	7440-41-7	
Boron, Dissolved	15200	ug/L	500	100	03/28/18 09:42	03/29/18 10:00	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/18 09:42	03/28/18 15:21	7440-43-9	
Chromium, Dissolved	3.2	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-47-3	
Cobalt, Dissolved	0.96	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-48-4	
Lead, Dissolved	0.42	ug/L	0.10	1	03/28/18 09:42	03/28/18 15:21	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 15:21	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:21	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/28/18 09:42	03/28/18 15:21	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/29/18 09:14	03/29/18 12:45	7439-97-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	79.3	mg/L	20.0	10	03/23/18 18:23	03/28/18 14:57		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	18400	NTU	150	500		03/24/18 11:28		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	22200	mg/L	66.7	1		03/29/18 10:40		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.7	Std. Units	0.10	1		03/27/18 14:30		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		04/04/18 10:29		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Sample: FD-SB-B4		Lab ID: 10424766001		Collected: 03/23/18 15:00	Received: 03/23/18 16:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions		Analytical Method: EPA 300.0						
Fluoride	ND	mg/L	0.050	1		03/31/18 02:07	16984-48-8	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr D Modified						
Chromium, Hexavalent	0.060	mg/L	0.010	1		03/24/18 11:24		FS,M3
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	32.4	mg/L	1.0	1	04/02/18 07:00	04/03/18 08:35	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	ND	mg/L	0.020	1		03/24/18 11:17	14797-55-8	FS
Nitrite as N	0.027	mg/L	0.020	1		03/24/18 11:17	14797-65-0	FS
Nitrogen, NO ₂ plus NO ₃	0.032	mg/L	0.020	1		03/24/18 11:17		FS
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	6.1	mg/L	0.25	5	04/03/18 10:29	04/03/18 17:12	7723-14-0	

Sample: FD-SB-D4		Lab ID: 10424766002		Collected: 03/23/18 15:30	Received: 03/23/18 16:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	309-00-2	
alpha-BHC	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	319-84-6	
beta-BHC	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	319-85-7	
delta-BHC	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	58-89-9	
Chlordane (Technical)	ND	ug/L	5.4	10	03/27/18 14:00	04/05/18 17:18	57-74-9	
alpha-Chlordane	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	5103-71-9	
gamma-Chlordane	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	5103-74-2	
4,4'-DDD	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	72-54-8	
4,4'-DDE	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	72-55-9	
4,4'-DDT	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	50-29-3	
Dieldrin	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	60-57-1	
Endosulfan I	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	959-98-8	
Endosulfan II	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	33213-65-9	
Endosulfan sulfate	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	1031-07-8	
Endrin	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	72-20-8	
Endrin aldehyde	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	7421-93-4	
Endrin ketone	ND	ug/L	1.1	10	03/27/18 14:00	04/05/18 17:18	53494-70-5	
Heptachlor	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	76-44-8	
Heptachlor epoxide	ND	ug/L	0.54	10	03/27/18 14:00	04/05/18 17:18	1024-57-3	
Methoxychlor	ND	ug/L	5.4	10	03/27/18 14:00	04/05/18 17:18	72-43-5	
Toxaphene	ND	ug/L	16.1	10	03/27/18 14:00	04/05/18 17:18	8001-35-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Project No.: 10424766

Sample: FD-SB-D4	Lab ID: 10424766002	Collected: 03/23/18 15:30	Received: 03/23/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Surrogates								
Tetrachloro-m-xylene (S)	0	%.	62-125	10	03/27/18 14:00	04/05/18 17:18	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%.	30-143	10	03/27/18 14:00	04/05/18 17:18	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/27/18 14:00	04/03/18 13:11	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	68	%.	30-125	1	03/27/18 14:00	04/03/18 13:11	877-09-8	
Decachlorobiphenyl (S)	35	%.	30-125	1	03/27/18 14:00	04/03/18 13:11	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/29/18 10:55	03/30/18 16:43	7429-90-5	
Barium, Dissolved	694	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:43	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:43	7440-50-8	
Manganese, Dissolved	351	ug/L	5.0	1	03/29/18 10:55	03/30/18 16:43	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:43	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/18 10:55	03/30/18 16:43	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/29/18 10:55	03/30/18 16:43	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/18 10:55	03/30/18 16:43	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	6.0	ug/L	2.5	5	03/28/18 10:49	03/29/18 00:18	7440-47-3	
Total Hardness by 2340B	1030000	ug/L	14100	100	03/28/18 10:49	03/29/18 00:21		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-36-0	
Arsenic, Dissolved	8.1	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/18 09:42	03/28/18 15:25	7440-41-7	
Boron, Dissolved	19500	ug/L	500	100	03/28/18 09:42	03/29/18 10:03	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/18 09:42	03/28/18 15:25	7440-43-9	
Chromium, Dissolved	4.7	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-47-3	
Cobalt, Dissolved	2.3	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 15:25	7439-92-1	
Selenium, Dissolved	0.81	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/18 09:42	03/28/18 15:25	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/28/18 09:42	03/28/18 15:25	7440-61-1	
Vanadium, Dissolved	1.7	ug/L	1.0	1	03/28/18 09:42	03/28/18 15:25	7440-62-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Sample: FD-SB-D4	Lab ID: 10424766002	Collected: 03/23/18 15:30	Received: 03/23/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/29/18 09:14	03/29/18 12:47	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	83-32-9	
Anthracene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	50-32-8	
Benzoic acid	ND	ug/L	53.8	1	03/26/18 15:13	03/30/18 10:59	65-85-0	3M
4-Bromophenylphenyl ether	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	111-44-4	
2-Chlorophenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	53.8	1	03/26/18 15:13	03/30/18 10:59	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	120-83-2	
Diethylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	84-66-2	
2,4-Dimethylphenol	ND	ug/L	53.8	1	03/26/18 15:13	03/30/18 10:59	105-67-9	
Dimethylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	117-81-7	
Fluoranthene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	206-44-0	
Fluorene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	86-73-7	
Hexachlorobenzene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	53.8	1	03/26/18 15:13	03/30/18 10:59	77-47-4	
Hexachloroethane	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	67-72-1	
Isophorone	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.5	1	03/26/18 15:13	03/30/18 10:59		
N-Nitrosodiphenylamine	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	86-30-6	
Pentachlorophenol	ND	ug/L	21.5	1	03/26/18 15:13	03/30/18 10:59	87-86-5	
Phenanthrene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	85-01-8	
Phenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	108-95-2	
Pyrene	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.8	1	03/26/18 15:13	03/30/18 10:59	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	73	%	60-125	1	03/26/18 15:13	03/30/18 10:59	4165-60-0	
2-Fluorobiphenyl (S)	79	%	56-125	1	03/26/18 15:13	03/30/18 10:59	321-60-8	
p-Terphenyl-d14 (S)	87	%	58-125	1	03/26/18 15:13	03/30/18 10:59	1718-51-0	
Phenol-d6 (S)	84	%	58-125	1	03/26/18 15:13	03/30/18 10:59	13127-88-3	
2-Fluorophenol (S)	75	%	55-125	1	03/26/18 15:13	03/30/18 10:59	367-12-4	
2,4,6-Tribromophenol (S)	86	%	65-125	1	03/26/18 15:13	03/30/18 10:59	118-79-6	

Field Data

Analytical Method:

Field pH	6.9	Std. Units	1	03/22/18 00:00
Field Temperature	10.0	deg C	1	03/22/18 00:00

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Sample: FD-SB-D4	Lab ID: 10424766002	Collected: 03/23/18 15:30	Received: 03/23/18 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	24.0	mg/L	20.0	10	03/23/18 18:23	03/28/18 14:59		
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.7	1		04/02/18 09:56		1M
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	309	NTU	30.0	100		03/24/18 11:29		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	220	mg/L	10.0	1		03/29/18 10:40		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.6	Std. Units	0.10	1		03/29/18 15:58		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		04/04/18 10:29		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Fluoride	0.14	mg/L	0.050	1		03/31/18 02:37	16984-48-8	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/24/18 11:24		FS
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.15	mg/L	0.010	1		04/10/18 12:42		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	99.2	mg/L	0.80	8	04/02/18 07:00	04/03/18 08:56	7664-41-7	
353.2 Nitrate + Nitrite								
Analytical Method: EPA 353.2								
Nitrate as N	ND	mg/L	0.020	1		03/24/18 11:18	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/24/18 11:18	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/24/18 11:18		FS,M1
9016 Cyanide, Free								
Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:15		
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	26.0	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:48	57-12-5	
SM4500P-E, Total Phosphorus								
Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B								
Phosphorus	0.29	mg/L	0.050	1	04/03/18 10:29	04/03/18 16:22	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 529546 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2874431 Matrix: Water

Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	03/30/18 16:29	
Barium, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Copper, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Manganese, Dissolved	ug/L	ND	5.0	03/30/18 16:29	
Nickel, Dissolved	ug/L	ND	20.0	03/30/18 16:29	
Silver, Dissolved	ug/L	ND	10.0	03/30/18 16:29	
Tin, Dissolved	ug/L	ND	75.0	03/30/18 16:29	
Zinc, Dissolved	ug/L	ND	20.0	03/30/18 16:29	

LABORATORY CONTROL SAMPLE & LCSD: 2874432

2874433

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	20900	104	104	85-115	1	20	
Barium, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Copper, Dissolved	ug/L	1000	977	981	98	98	85-115	0	20	
Manganese, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Nickel, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Silver, Dissolved	ug/L	500	494	495	99	99	85-115	0	20	
Tin, Dissolved	ug/L	1000	983	981	98	98	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529357 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2873355 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	03/29/18 00:00	

LABORATORY CONTROL SAMPLE: 2873356

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	112	112	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873357 2873358

Parameter	Units	30247016001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Chromium	ug/L	0.42J	100	100	114	115	114	115	70-130	1	20			

MATRIX SPIKE SAMPLE: 2873359

Parameter	Units	10425051001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	12.6	100	123	110	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529354 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2873346 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Arsenic, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Beryllium, Dissolved	ug/L	ND	0.20	03/28/18 14:47	
Boron, Dissolved	ug/L	ND	5.0	03/28/18 14:47	
Cadmium, Dissolved	ug/L	ND	0.080	03/28/18 14:47	
Chromium, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Cobalt, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Lead, Dissolved	ug/L	ND	0.10	03/28/18 14:47	
Selenium, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Thallium, Dissolved	ug/L	ND	0.10	03/28/18 14:47	
Uranium-238, Dissolved	ug/L	ND	0.50	03/28/18 14:47	
Vanadium, Dissolved	ug/L	ND	1.0	03/28/18 14:47	

LABORATORY CONTROL SAMPLE: 2873347

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	102	102	85-115	
Arsenic, Dissolved	ug/L	100	104	104	85-115	
Beryllium, Dissolved	ug/L	100	108	108	85-115	
Boron, Dissolved	ug/L	100	115	115	85-115	
Cadmium, Dissolved	ug/L	100	104	104	85-115	
Chromium, Dissolved	ug/L	100	108	108	85-115	
Cobalt, Dissolved	ug/L	100	105	105	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	105	105	85-115	
Thallium, Dissolved	ug/L	100	104	104	85-115	
Uranium-238, Dissolved	ug/L	100	109	109	85-115	
Vanadium, Dissolved	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873348 2873349

Parameter	Units	10424606001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	MS Result	MSD Result						
Antimony, Dissolved	ug/L	ND	100	100	110	112	110	112	70-130	2	20	
Arsenic, Dissolved	ug/L	0.66	100	100	110	114	110	113	70-130	3	20	
Beryllium, Dissolved	ug/L	ND	100	100	116	117	116	117	70-130	1	20	
Boron, Dissolved	ug/L	1690	100	100	1850	1870	153	176	70-130	1	20	M1
Cadmium, Dissolved	ug/L	ND	100	100	108	111	108	111	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873348												2873349	
Parameter	Units	10424606001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Chromium, Dissolved	ug/L	0.56	100	100	113	115	112	115	70-130	2	20		
Cobalt, Dissolved	ug/L	ND	100	100	109	111	108	111	70-130	3	20		
Lead, Dissolved	ug/L	ND	100	100	109	113	109	113	70-130	3	20		
Selenium, Dissolved	ug/L	ND	100	100	107	108	107	108	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	109	112	109	112	70-130	3	20		
Uranium-238, Dissolved	ug/L	3.3	100	100	114	120	111	116	70-130	5	20		
Vanadium, Dissolved	ug/L	1.7	100	100	113	116	111	115	70-130	3	20		

MATRIX SPIKE SAMPLE: 2873350											
Parameter	Units	10425051001 Result	Spike	MS	MS	% Rec	Qualifiers				
			Conc.	Result	% Rec	Limits					
Antimony, Dissolved	ug/L	ND	100	111	111	70-130					
Arsenic, Dissolved	ug/L	ND	100	114	111	70-130					
Beryllium, Dissolved	ug/L	ND	100	117	117	70-130					
Boron, Dissolved	ug/L	245	100	344	99	70-130					
Cadmium, Dissolved	ug/L	ND	100	107	107	70-130					
Chromium, Dissolved	ug/L	ND	100	118	114	70-130					
Cobalt, Dissolved	ug/L	ND	100	108	108	70-130					
Lead, Dissolved	ug/L	ND	100	111	111	70-130					
Selenium, Dissolved	ug/L	ND	100	115	111	70-130					
Thallium, Dissolved	ug/L	ND	100	110	109	70-130					
Uranium-238, Dissolved	ug/L	5.1	100	118	113	70-130					
Vanadium, Dissolved	ug/L	ND	100	120	115	70-130					

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529156 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10424766002

METHOD BLANK: 2872152 Matrix: Water
Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/05/18 16:23	
4,4'-DDE	ug/L	ND	0.10	04/05/18 16:23	
4,4'-DDT	ug/L	ND	0.10	04/05/18 16:23	
Aldrin	ug/L	ND	0.050	04/05/18 16:23	
alpha-BHC	ug/L	ND	0.050	04/05/18 16:23	
alpha-Chlordane	ug/L	ND	0.050	04/05/18 16:23	
beta-BHC	ug/L	ND	0.050	04/05/18 16:23	
Chlordane (Technical)	ug/L	ND	0.50	04/05/18 16:23	
delta-BHC	ug/L	ND	0.050	04/05/18 16:23	
Dieldrin	ug/L	ND	0.10	04/05/18 16:23	
Endosulfan I	ug/L	ND	0.050	04/05/18 16:23	
Endosulfan II	ug/L	ND	0.10	04/05/18 16:23	
Endosulfan sulfate	ug/L	ND	0.10	04/05/18 16:23	
Endrin	ug/L	ND	0.10	04/05/18 16:23	
Endrin aldehyde	ug/L	ND	0.10	04/05/18 16:23	
Endrin ketone	ug/L	ND	0.10	04/05/18 16:23	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/05/18 16:23	
gamma-Chlordane	ug/L	ND	0.050	04/05/18 16:23	
Heptachlor	ug/L	ND	0.050	04/05/18 16:23	
Heptachlor epoxide	ug/L	ND	0.050	04/05/18 16:23	
Methoxychlor	ug/L	ND	0.50	04/05/18 16:23	
Toxaphene	ug/L	ND	1.5	04/05/18 16:23	
Decachlorobiphenyl (S)	%	92	30-143	04/05/18 16:23	
Tetrachloro-m-xylene (S)	%	93	62-125	04/05/18 16:23	

LABORATORY CONTROL SAMPLE & LCSD: 2872153

Parameter	Units	2872154							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	1.0	100	102	67-125	1	20		
4,4'-DDE	ug/L	1	0.97	0.99	97	99	68-125	1	20		
4,4'-DDT	ug/L	1	1.0	1.0	101	101	66-125	1	20		
Aldrin	ug/L	.5	0.43	0.43	87	86	46-125	1	20		
alpha-BHC	ug/L	.5	0.45	0.45	90	90	66-125	1	20		
alpha-Chlordane	ug/L	.5	0.47	0.47	94	94	72-125	0	20		
beta-BHC	ug/L	.5	0.47	0.47	94	94	72-125	0	20		
delta-BHC	ug/L	.5	0.30	0.30	59	60	37-141	1	20		
Dieldrin	ug/L	1	1.0	1.0	104	105	71-125	0	20		
Endosulfan I	ug/L	.5	0.45	0.44	89	89	69-125	0	20		
Endosulfan II	ug/L	1	1.0	1.0	102	102	73-125	0	20		
Endosulfan sulfate	ug/L	1	0.85	0.86	85	86	63-127	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Parameter	Units	2872153		2872154			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	0.96	0.97	96	97	72-125	1	20	
Endrin aldehyde	ug/L	1	0.96	0.97	96	97	70-125	2	20	
Endrin ketone	ug/L	1	1.0	1.1	105	106	72-127	1	20	
gamma-BHC (Lindane)	ug/L	.5	0.46	0.47	93	94	69-125	1	20	
gamma-Chlordane	ug/L	.5	0.42	0.42	84	84	64-125	0	20	
Heptachlor	ug/L	.5	0.47	0.46	94	93	54-125	2	20	
Heptachlor epoxide	ug/L	.5	0.47	0.47	95	94	72-125	0	20	
Methoxychlor	ug/L	5	5.0	5.1	100	102	67-127	2	20	
Decachlorobiphenyl (S)	%.				86	89	30-143			
Tetrachloro-m-xylene (S)	%.				90	90	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch:	529157	Analysis Method:	EPA 8082A
QC Batch Method:	EPA Mod. 3510C	Analysis Description:	8082A GCS PCB
Associated Lab Samples:	10424766002		

METHOD BLANK: 2872155 Matrix: Water

Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/03/18 12:39	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/03/18 12:39	
Decachlorobiphenyl (S)	%	91	30-125	04/03/18 12:39	
Tetrachloro-m-xylene (S)	%	67	30-125	04/03/18 12:39	

LABORATORY CONTROL SAMPLE & LCSD: 2872156

2872157

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.5	80	75	47-125	6	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.7	1.6	83	82	54-125	1	20	
Decachlorobiphenyl (S)	%				85	84	30-125			
Tetrachloro-m-xylene (S)	%				77	74	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 529059 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10424766002

METHOD BLANK: 2871273 Matrix: Water
Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	03/29/18 22:06	
2,4-Dichlorophenol	ug/L	ND	10.0	03/29/18 22:06	
2,4-Dimethylphenol	ug/L	ND	50.0	03/29/18 22:06	
2,4-Dinitrophenol	ug/L	ND	10.0	03/29/18 22:06	
2-Chlorophenol	ug/L	ND	10.0	03/29/18 22:06	
2-Methylnaphthalene	ug/L	ND	10.0	03/29/18 22:06	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	03/29/18 22:06	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	03/29/18 22:06	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	03/29/18 22:06	
4-Bromophenylphenyl ether	ug/L	ND	10.0	03/29/18 22:06	
Acenaphthene	ug/L	ND	10.0	03/29/18 22:06	
Anthracene	ug/L	ND	10.0	03/29/18 22:06	
Benzo(a)pyrene	ug/L	ND	10.0	03/29/18 22:06	
Benzoic acid	ug/L	ND	50.0	03/29/18 22:06	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	03/29/18 22:06	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	03/29/18 22:06	
Butylbenzylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Di-n-butylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Di-n-octylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Diethylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Dimethylphthalate	ug/L	ND	10.0	03/29/18 22:06	
Fluoranthene	ug/L	ND	10.0	03/29/18 22:06	
Fluorene	ug/L	ND	10.0	03/29/18 22:06	
Hexachlorobenzene	ug/L	ND	10.0	03/29/18 22:06	
Hexachlorocyclopentadiene	ug/L	ND	50.0	03/29/18 22:06	
Hexachloroethane	ug/L	ND	10.0	03/29/18 22:06	
Isophorone	ug/L	ND	10.0	03/29/18 22:06	
N-Nitrosodiphenylamine	ug/L	ND	10.0	03/29/18 22:06	
Pentachlorophenol	ug/L	ND	20.0	03/29/18 22:06	
Phenanthrene	ug/L	ND	10.0	03/29/18 22:06	
Phenol	ug/L	ND	10.0	03/29/18 22:06	
Pyrene	ug/L	ND	10.0	03/29/18 22:06	
2,4,6-Tribromophenol (S)	%	73	65-125	03/29/18 22:06	
2-Fluorobiphenyl (S)	%	75	56-125	03/29/18 22:06	
2-Fluorophenol (S)	%	71	55-125	03/29/18 22:06	
Nitrobenzene-d5 (S)	%	69	60-125	03/29/18 22:06	
p-Terphenyl-d14 (S)	%	103	58-125	03/29/18 22:06	
Phenol-d6 (S)	%	73	58-125	03/29/18 22:06	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

LABORATORY CONTROL SAMPLE & LCSD: 2871274		2871275									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	39.2	38.3	78	77	74-125	2	20		
2,4-Dichlorophenol	ug/L	50	36.4	37.8	73	76	68-125	4	20		
2,4-Dimethylphenol	ug/L	50	32.2J	33.1J	64	66	33-125		20		
2,4-Dinitrophenol	ug/L	50	31.8	32.6	64	65	30-127	3	20		
2-Chlorophenol	ug/L	50	32.8	34.4	66	69	61-125	5	20		
2-Methylnaphthalene	ug/L	50	36.4	37.4	73	75	67-125	3	20		
2-Methylphenol(o-Cresol)	ug/L	50	32.9	34.3	66	69	63-125	4	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	34.5	36.0	69	72	67-125	4	20		
3,3'-Dichlorobenzidine	ug/L	50	50.1	48.1J	100	96	60-125		20		
4-Bromophenylphenyl ether	ug/L	50	41.5	40.2	83	80	75-125	3	20		
Acenaphthene	ug/L	50	39.1	38.3	78	77	74-125	2	20		
Anthracene	ug/L	50	43.0	40.3	86	81	75-125	7	20		
Benzo(a)pyrene	ug/L	50	41.7	40.2	83	80	75-125	4	20		
Benzoic acid	ug/L	50	17.9J	22.6J	36	45	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	31.1	32.4	62	65	55-125	4	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	40.1	38.9	80	78	72-129	3	20		
Butylbenzylphthalate	ug/L	50	40.6	38.9	81	78	69-127	4	20		
Di-n-butylphthalate	ug/L	50	40.3	39.4	81	79	75-125	2	20		
Di-n-octylphthalate	ug/L	50	41.0	39.6	82	79	69-131	3	20		
Diethylphthalate	ug/L	50	41.6	40.1	83	80	75-125	4	20		
Dimethylphthalate	ug/L	50	41.0	39.4	82	79	75-125	4	20		
Fluoranthene	ug/L	50	42.4	40.8	85	82	75-125	4	20		
Fluorene	ug/L	50	40.5	39.1	81	78	75-125	3	20		
Hexachlorobenzene	ug/L	50	41.0	39.3	82	79	74-125	4	20		
Hexachlorocyclopentadiene	ug/L	50	20.3J	20.7J	41	41	30-125		20		
Hexachloroethane	ug/L	50	31.3	32.6	63	65	30-125	4	20		
Isophorone	ug/L	50	36.9	36.6	74	73	72-125	1	20		
N-Nitrosodiphenylamine	ug/L	50	40.6	39.1	81	78	75-125	4	20		
Pentachlorophenol	ug/L	50	35.6	35.6	71	71	52-125	0	20		
Phenanthrene	ug/L	50	42.3	40.2	85	80	75-125	5	20		
Phenol	ug/L	50	32.8	35.2	66	70	59-125	7	20		
Pyrene	ug/L	50	42.3	40.9	85	82	75-125	3	20		
2,4,6-Tribromophenol (S)	%				83	80	65-125				
2-Fluorobiphenyl (S)	%				79	78	56-125				
2-Fluorophenol (S)	%				67	70	55-125				
Nitrobenzene-d5 (S)	%				69	71	60-125				
p-Terphenyl-d14 (S)	%				91	89	58-125				
Phenol-d6 (S)	%				71	75	58-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 528769

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2869664

Matrix: Water

Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	03/28/18 14:31	

LABORATORY CONTROL SAMPLE & LCSD: 2869666

2869822

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	198	198	208	100	105	85-115	5	20	

SAMPLE DUPLICATE: 2869667

Parameter	Units	10424571001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	177	252	35	20	D6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 530075	Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG	Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10424766002	

METHOD BLANK: 2877442 Matrix: Water

Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/02/18 09:56	

LABORATORY CONTROL SAMPLE & LCSD: 2877443

2877444

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	40	32.9	31.6	82	79	78-114	4	18	

MATRIX SPIKE SAMPLE: 2877445

Parameter	Units	10424683004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	30.2	43.5	70.0	92	78-114	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 528880

Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1

Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2870624

Matrix: Water

Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/24/18 11:24	

LABORATORY CONTROL SAMPLE: 2870625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.4	102	90-110	

SAMPLE DUPLICATE: 2870626

Parameter	Units	10424809001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	30.2	29.0	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529572 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2874524 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/29/18 10:40	

LABORATORY CONTROL SAMPLE: 2874525

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	90.0	90	80-120	

SAMPLE DUPLICATE: 2874526

Parameter	Units	10424772001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<5.0	ND		10	

SAMPLE DUPLICATE: 2874527

Parameter	Units	10424814001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	151	150	1	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch: 529639 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10424766002

LABORATORY CONTROL SAMPLE: 2874718

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2874719

Parameter	Units	10425318005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	3	H6

SAMPLE DUPLICATE: 2874720

Parameter	Units	10425318006 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 528877 Analysis Method: SM 3500-Cr D Modified
QC Batch Method: SM 3500-Cr D Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2870604 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/24/18 11:24	FS

LABORATORY CONTROL SAMPLE: 2870605

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870606 2870607

Parameter	Units	2870606		2870607		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10424766001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium, Hexavalent	mg/L	0.060	.2	.2	0.038	0.036	-11	-12	85-115	6	20	FS,M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 139700 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 553300 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/03/18 08:30	

LABORATORY CONTROL SAMPLE: 553301

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10.3	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553302 553303

Parameter	Units	10424606001		553302		553303		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Nitrogen, Ammonia	mg/L	2.0	10	10	10	9.8	10.0	78	80	90-110	2	10 M0

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 528878 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2870608 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/24/18 11:22	FS
Nitrite as N	mg/L	ND	0.020	03/24/18 11:22	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/24/18 11:22	FS

LABORATORY CONTROL SAMPLE: 2870609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.95	95	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	1.0	102	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2870610 2870611

Parameter	Units	10424766002		2870610		2870611		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Nitrite as N	mg/L	ND	1	1	0.94	0.94	93	94	90-110	1	20	FS
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.89	0.96	89	96	90-110	8	20	FS,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

QC Batch:	19623	Analysis Method:	EPA 9016
QC Batch Method:	EPA 9016	Analysis Description:	9016 Free Cyanide
Associated Lab Samples:	10424766002		

METHOD BLANK: 77969 Matrix: Water
Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971 77972

Parameter	Units	10424606001		77971		77972		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Cyanide, Free	ug/L	ND	ND	150	150	160	160	106	106	80-120	0	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 530296 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10424766002

METHOD BLANK: 2878424 Matrix: Water
Associated Lab Samples: 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/03/18 12:40	

LABORATORY CONTROL SAMPLE: 2878425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	241	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878426 2878427

Parameter	Units	10423797004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	1.5 mg/L	250	250	1950	1840	172	128	80-120	6	30	H3,M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878428 2878429

Parameter	Units	10425152001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	38.4	250	250	269	268	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424766

QC Batch: 530336 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10424766001, 10424766002

METHOD BLANK: 2878501 Matrix: Water
Associated Lab Samples: 10424766001, 10424766002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/03/18 16:05	

LABORATORY CONTROL SAMPLE: 2878502

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878503 2878504

Parameter	Units	10425125001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	0.070	1	1	1.2	1.2	115	116	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878505 2878506

Parameter	Units	10425125002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	11.8	1	1	12.6	12.5	78	70	80-120	1	30	M6

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-M Pace Analytical Services - Minneapolis

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10424766

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 529648

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530075

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 530078

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530399

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

ANALYTE QUALIFIERS

- 1M Sample pH adjusted using 1mL 6N HCl.
- 2M Sample was yellow in color. Emulsion was also present during the extraction process.
- 3M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
- FS The sample was filtered in the laboratory prior to analysis.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424766

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424766002	FD-SB-D4	EPA Mod. 3510C	529156	EPA 8081B	530399
10424766002	FD-SB-D4	EPA Mod. 3510C	529157	EPA 8082A	530078
10424766001	FD-SB-B4	EPA 200.7	529546	EPA 200.7	529681
10424766002	FD-SB-D4	EPA 200.7	529546	EPA 200.7	529681
10424766001	FD-SB-B4	EPA 200.8	529357	EPA 200.8	529494
10424766002	FD-SB-D4	EPA 200.8	529357	EPA 200.8	529494
10424766001	FD-SB-B4	EPA 200.8	529354	EPA 200.8	529496
10424766002	FD-SB-D4	EPA 200.8	529354	EPA 200.8	529496
10424766001	FD-SB-B4	EPA 245.1	529562	EPA 245.1	529636
10424766002	FD-SB-D4	EPA 245.1	529562	EPA 245.1	529636
10424766002	FD-SB-D4	EPA 3520	529059	EPA 8270D	529648
10424766002	FD-SB-D4				
10424766001	FD-SB-B4	Hach 10360	528769	Hach 10360 Rev 1.1	528875
10424766002	FD-SB-D4	Hach 10360	528769	Hach 10360 Rev 1.1	528875
10424766002	FD-SB-D4	EPA 1664A OG	530075		
10424766001	FD-SB-B4	EPA 180.1	528880		
10424766002	FD-SB-D4	EPA 180.1	528880		
10424766001	FD-SB-B4	SM 2540D	529572		
10424766002	FD-SB-D4	SM 2540D	529572		
10424766001	FD-SB-B4	SM 4500-H+B	529218		
10424766002	FD-SB-D4	SM 4500-H+B	529639		
10424766001	FD-SB-B4	Trivalent Chromium Calculation	530596		
10424766002	FD-SB-D4	Trivalent Chromium Calculation	530596		
10424766001	FD-SB-B4	EPA 300.0	529627		
10424766002	FD-SB-D4	EPA 300.0	529627		
10424766001	FD-SB-B4	SM 3500-Cr D Modified	528877		
10424766002	FD-SB-D4	SM 3500-Cr D Modified	528877		
10424766002	FD-SB-D4	EPA 350.1			
10424766001	FD-SB-B4	EPA 350.1 rev. 2 (1993)	139700	EPA 350.1 rev. 2 (1993)	139774
10424766002	FD-SB-D4	EPA 350.1 rev. 2 (1993)	139700	EPA 350.1 rev. 2 (1993)	139774
10424766001	FD-SB-B4	EPA 353.2	528878		
10424766002	FD-SB-D4	EPA 353.2	528878		
10424766002	FD-SB-D4	EPA 9016	19623	EPA 9016	19643
10424766002	FD-SB-D4	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10424766001	FD-SB-B4	SM 4500-P B	530336	SM 4500-P E	530390
10424766002	FD-SB-D4	SM 4500-P B	530336	SM 4500-P E	530390

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WO#: 10424766



Chain-of-Custody Form

Work
Tu

PROJECT/CLIENT INFO

Facility Code:	MPCA FREEWAY LE WATERS	Program Code (MDH Lab Only):	Lab Name:
Project Name:	MPCA FREEWAY LE WATERS	Project Task Code:	Address: 18-00383
Project Manager:			EPIC Profile # 38716
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES		LAB MATRIX CODES		FIELD MATRIX CODES		ANALYSIS	PRESERV.	Lab Sample No.	#						
Sample	Code	Sample	Code	Sample	Code										
Sample	QC-FB=Field Blank Sample	DW=Drinking Water	AR=Air	Wtr-Ground=Groundwater											
S-IVP=Integrated Vertical Profile Sample	QC-FR=Field Replicate Sample	NW=Non-potable Water	BL=Biological Material	Wtr-Surf=Surface Water											
S-CWOP=Composite Sample	QC-TB=Trip Blank Sample	SD=Soil/Solid	OT=Other	QC-BLANK=Artificial Blank Water											
		WP=Wipe	TS=Tissue	Leachate=Leachate Sample											
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	PRESERV.	Lab Sample No.	#
FD-SB-A4		3/23/18								No sample	17	LIST A, B, C			1
FD-SB-B4	S	3/23/18	1500			G	NW				5	X		001	2
FD-SB-D4	S	3/23/18	1530			G	NW				17	X		002	3
															4
															5
															6
															7
															8
															9
															10

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) David Anderson / Pace	3/23/18 / 1600	M. Pace	3/23/18 / 1600

T=8.7

(1) For FD-SB-B4 collected partial list of List A, (2) 1 L GN / (1) HNO3 filtered, (1) HNO3 UNFILT, (1) 250 H2504

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals: Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

-- Analysis by MDH Laboratory

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500ClO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA). BGJ-Pace

Sample Condition Upon Receipt

Client Name: MPCA

Project #: _____

WO# : 10424766

PM: BM2

Due Date: 04/06/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 8.5 Cooler Temp Corrected (°C): 8.7 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 3/23/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>W.F.</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1 2/2</u> <u>1/1</u>
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC <u>Oil and Grease</u>	<u>2 2/2</u> <u>1/1</u> <u>1/1</u>
DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: <u>ME</u> Lot # of added preservative: <u>3116093</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: BA VC

Date: 3/26/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Sample Condition Upon Receipt

Client Name: Pace Mpls

Project #: **WO# : 12106323**
 PM: HRZ Due Date: 04/06/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: Bm 3/27/18

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 3/27/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client <i>Pace Minnesota</i>	Work Order #: <i>469976</i>
Receipt Record Page/Line # <i>15-5</i>	Project Chemist / Sample #s

Recorded by (initials/date) <i>PS 8/27/18</i>	<input type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received <i>1</i>	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> See Additional Cooler Information Form <input type="checkbox"/> Other (#)
--	---	--------------------------	---

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time	
<i>Reel</i>	<i>103C</i>							
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None Coolant Location: <input checked="" type="checkbox"/> Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C
Temp Blank:			Temp Blank:			Temp Blank:		
Sample 1:	<i>1.8</i>		Sample 1:		<i>1.8</i>	Sample 1:		
Sample 2:	<i>1.7</i>		Sample 2:		<i>1.7</i>	Sample 2:		
Sample 3:	<i>1.0</i>		Sample 3:		<i>1.0</i>	Sample 3:		
3 Sample Average °C:			3 Sample Average °C:			3 Sample Average °C:		
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Chain of Custody record(s)? If No, Initiated By _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Received for Lab Signed/Date/Time?
<input type="checkbox"/>	<input type="checkbox"/>	Shipping document?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other _____

COC Information

Pace COC Other _____

COC ID Numbers:

Check COC for Accuracy

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Analysis Requested?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID matches COC?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample Date and Time matches COC?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Container type completed on COC?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	All container types indicated are received?

Sample Condition Summary

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Broken containers/lids?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Missing or incomplete labels?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Illegible information on labels?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Low volume received?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Inappropriate or non-Pace containers received?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VOC vials / TOX containers have headspace?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Blank OR average sample temperature, ≥6° C?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If either is ≥6° C, was thermal preservation required?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes", Project Chemist Approval Initials: _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes" Completed Non Con Cooler - Cont Inventory Form?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Completed Sample Preservation Verification Form?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Samples chemically preserved correctly?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "No", added orange tag?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Received pre-preserved VOC soils?
	<input type="checkbox"/>	<input type="checkbox"/>	MeOH <input type="checkbox"/> Na ₂ SO ₄

Check for Short Hold-Time Prep/Analyses

<input type="checkbox"/>	Bacteriological
<input type="checkbox"/>	Air Bags
<input type="checkbox"/>	EnCores / Methanol Pre-Preserved
<input type="checkbox"/>	Formaldehyde/Aldehyde
<input type="checkbox"/>	Green-tagged containers
<input type="checkbox"/>	Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
 NONE RECEIVED
 RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
<i>PS 8/27/18</i>	<i>PS 8/27/18</i>	Yes / No

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client <i>Pace - Minnesota</i>	Work Order # <i>469926</i>
Receipt Log # <i>15-5-2</i>	Completed By (initials/date) <i>PS 3/27/18</i>
Project Manager	

COC ID #												Adjusted by: _____			
												Date: _____			
Container Type	5 / 23		4		13		6		15						
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted			
COC Line #1	✓	N/A													
COC Line #2															
COC Line #3															
COC Line #4															
COC Line #5															
COC Line #6															
COC Line #7															
COC Line #8															
COC Line #9															
COC Line #10															
COC Line #11															
COC Line #12															

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments:

COC ID #												Adjusted by: _____			
												Date: _____			
Container Type	5 / 23		4		13		6		15						
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted			
COC Line #1															
COC Line #2															
COC Line #3															
COC Line #4															
COC Line #5															
COC Line #6															
COC Line #7															
COC Line #8															
COC Line #9															
COC Line #10															
COC Line #11															
COC Line #12															

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments:

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

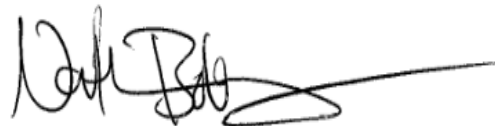
Pace Project #: 10424768
Sample Receipt Date: 03/23/2018
Client Project #: MPCA Freeway LF Wat
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 05, 2018

Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 5, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 54%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 121-124% with a relative percent difference of 2.4%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10424768



10424768

Report No.: 10424768_1613TCDD_DFR

		Chain-of-Custody Form				Work Order Number: 10424768		1 of											
PROJECT/CLIENT INFO				Turnaround Time:		COC ID:													
Facility Code:		MPCA FreewayLF waters				Program Code (MDH Lab Only):		LABORATORY											
Project Name:		MPCA FreewayLF waters				Project Task Code:		Lab Name:											
Project Manager:		If yes, add information to Sampler Comments Section				Address:		18-00383											
Potential Hazard?		If yes, add information to Sampler Comments Section				Phone No:		EPIC Profile # 38716											
SAMPLE DETAILS						ANALYSIS REQUESTED													
SAMPLE TYPE CODES Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		FIELD MATRIX CODES Wt=Ground=Groundwater Ws=Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		AR=Air BL=Biological Material OT=Other TS=Tissue		PRESERV.											
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#					
FD-SB-A4		3/23/18								No sample	17	LIST A, B, C		1					
FD-SB-B4	S	3/23/18	1500			G	NW				5	LIST A		2					
FD-SB-D4	S	3/23/18	1530			G	NW				17		001	3					
														4					
														5					
														6					
														7					
														8					
														9					
														10					
Sampled By: David Anderson				Sampler's Signature: David Anderson				Phone #:											
Receiving Comments:																			
Relinquished By/Affiliation					Date/Time					Accepted By/ Affiliation					Date/Time				
(Sampler) David Anderson / Pace					3/23/18 / 1600					Pace					3/23/18 1600				

(1) For FD-SB-B4 collected partial list of List A, (2) 1 LGN / (1) HAN3 filtered, (1) HAN3 UNFILT, (1) 250 H2504 T=8.7

Page 5 of 13

Sample Condition Upon Receipt

Client Name: MPCA

Project #: _____

WO#: 10424768

PM: SCU

Due Date: 04/06/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 687A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 8.5 Cooler Temp Corrected (°C): 8.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 3/23/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH>9 Sulfide, NaOH>12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 03/23/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-D4		
Lab Sample ID	10424768001		
Filename	U180401B_17		
Injected By	BAL		
Total Amount Extracted	970 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/23/2018 15:30
ICAL ID	U171222	Received	03/23/2018 16:00
CCal Filename(s)	U180401B_01	Extracted	03/28/2018 13:35
Method Blank ID	BLANK-61371	Analyzed	04/02/2018 02:27

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	54
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61371	Matrix	Water
Filename	F180401B_06	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	03/28/2018 13:35
ICAL ID	F180329	Analyzed	04/01/2018 15:28
CCal Filename(s)	F180401B_01	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	74
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	87

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61372	Matrix	Water
Filename	F180401B_03	Dilution	NA
Total Amount Extracted	996 mL	Extracted	03/28/2018 13:35
ICAL ID	F180329	Analyzed	04/01/2018 13:13
CCal Filename	F180401B_01	Injected By	BAL
Method Blank ID	BLANK-61371		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	12	7.3	14.6	121
2,3,7,8-TCDD-37Cl4	10	8.7	3.7	15.8	87
2,3,7,8-TCDD-13C	100	72	25.0	141.0	72

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61373	Matrix	Water
Filename	F180401B_04	Dilution	NA
Total Amount Extracted	992 mL	Extracted	03/28/2018 13:35
ICAL ID	F180329	Analyzed	04/01/2018 13:58
CCal Filename	F180401B_01	Injected By	BAL
Method Blank ID	BLANK-61371		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	12	7.3	14.6	124
2,3,7,8-TCDD-37Cl4	10	7.4	3.7	15.8	74
2,3,7,8-TCDD-13C	100	54	25.0	141.0	54

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61372
Spike 1 Filename F180401B_03

Spike 2 ID LCSD-61373
Spike 2 Filename F180401B_04

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	121	124	2.4

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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April 13, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 27, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Unionized Ammonia was not calculated for sample FD-SB-A3 due to insufficient volume to conduct the field pH & Temperature..

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)607-6452
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
California Certification #2973
California Certification #2973
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512
Minnesota Department of Health, Certificate #1385941
Arkansas Department of Environmental Quality, Certificate #17-046-0
Georgia Environmental Protection Division, Stipulation
Illinois Environmental Protection Agency, Certificate #004325
Michigan Department of Environmental Quality, Laboratory #0034

New York State Department of Health, Serial #56192 and 56193
North Carolina Division of Water Resources, Certificate #659
Virginia Department of General Services, Certificate #9028
Wisconsin Department of Natural Resources, Laboratory #999472650
U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10424924001	FD-SB-B4	Water	03/26/18 15:00	03/27/18 08:15
10424924002	FD-SB-A3	Water	03/26/18 14:00	03/27/18 08:15

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10424924001	FD-SB-B4	EPA 8270D	JLR	38	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
10424924002	FD-SB-A3	EPA 200.7	IP	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	DCL	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
SM 4500-P E	DCL	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Sample: FD-SB-B4	Lab ID: 10424924001	Collected: 03/26/18 15:00	Received: 03/27/18 08:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	83-32-9	
Anthracene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	120-12-7	
Benzo(a)pyrene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	50-32-8	
Benzoic acid	ND	ug/L	529	10	03/29/18 14:54	04/03/18 21:22	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	101-55-3	
Butylbenzylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	111-44-4	
2-Chlorophenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	529	10	03/29/18 14:54	04/03/18 21:22	91-94-1	
2,4-Dichlorophenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	120-83-2	
Diethylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	84-66-2	
2,4-Dimethylphenol	ND	ug/L	529	10	03/29/18 14:54	04/03/18 21:22	105-67-9	
Dimethylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	131-11-3	
Di-n-butylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	84-74-2	
2,4-Dinitrophenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	51-28-5	
Di-n-octylphthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	117-81-7	
Fluoranthene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	206-44-0	
Fluorene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	86-73-7	
Hexachlorobenzene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	529	10	03/29/18 14:54	04/03/18 21:22	77-47-4	
Hexachloroethane	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	67-72-1	
Isophorone	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	78-59-1	
2-Methylnaphthalene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	212	10	03/29/18 14:54	04/03/18 21:22		
N-Nitrosodiphenylamine	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	86-30-6	
Pentachlorophenol	ND	ug/L	212	10	03/29/18 14:54	04/03/18 21:22	87-86-5	
Phenanthrene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	85-01-8	
Phenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	108-95-2	
Pyrene	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	106	10	03/29/18 14:54	04/03/18 21:22	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	60-125	10	03/29/18 14:54	04/03/18 21:22	4165-60-0	D3,S4
2-Fluorobiphenyl (S)	0	%	56-125	10	03/29/18 14:54	04/03/18 21:22	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	58-125	10	03/29/18 14:54	04/03/18 21:22	1718-51-0	S4
Phenol-d6 (S)	0	%	58-125	10	03/29/18 14:54	04/03/18 21:22	13127-88-3	S4
2-Fluorophenol (S)	0	%	55-125	10	03/29/18 14:54	04/03/18 21:22	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	65-125	10	03/29/18 14:54	04/03/18 21:22	118-79-6	S4
9016 Cyanide, Free								
Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:16		
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	11.0	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:52	57-12-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Sample: FD-SB-A3	Lab ID: 10424924002	Collected: 03/26/18 14:00	Received: 03/27/18 08:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/30/18 11:48	04/02/18 13:39	7429-90-5	
Barium, Dissolved	1110	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:39	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:39	7440-50-8	
Manganese, Dissolved	623	ug/L	5.0	1	03/30/18 11:48	04/02/18 13:39	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:39	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:39	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/30/18 11:48	04/02/18 13:39	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:39	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	7.3	ug/L	2.5	5	03/30/18 13:50	03/30/18 18:10	7440-47-3	
Total Hardness by 2340B	1030000	ug/L	14100	100	03/30/18 13:50	03/30/18 18:13		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-36-0	
Arsenic, Dissolved	0.75	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/18 11:48	03/30/18 13:10	7440-41-7	
Boron, Dissolved	33000	ug/L	1000	200	03/30/18 11:48	03/30/18 16:19	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/18 11:48	03/30/18 13:10	7440-43-9	
Chromium, Dissolved	3.7	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-47-3	
Cobalt, Dissolved	1.1	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-48-4	
Lead, Dissolved	1.2	ug/L	0.10	1	03/30/18 11:48	03/30/18 13:10	7439-92-1	
Selenium, Dissolved	0.72	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/18 11:48	03/30/18 13:10	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:10	7440-61-1	
Vanadium, Dissolved	2.3	ug/L	1.0	1	03/30/18 11:48	03/30/18 13:10	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/18 10:00	04/03/18 17:04	7439-97-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	4.7	mg/L	2.0	1	03/28/18 10:38	04/02/18 10:18		B3,B6
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	520	NTU	15.0	50		03/27/18 12:32		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	379	mg/L	10.0	1		03/30/18 10:31		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.4	Std. Units	0.10	1		03/30/18 16:35		H6
300.0 IC Anions								
Analytical Method: EPA 300.0								
Fluoride	0.065	mg/L	0.050	1		03/31/18 03:23	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Sample: FD-SB-A3	Lab ID: 10424924002	Collected: 03/26/18 14:00	Received: 03/27/18 08:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Chromium, Hexavalent	Analytical Method: SM 3500-Cr D Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		03/27/18 10:04		FS,M3
350.1 Ammonia	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	46.9	mg/L	1.6	40		03/30/18 13:59	7664-41-7	
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)							
Nitrogen, Ammonia	44.2	mg/L	0.50	5	04/09/18 09:30	04/10/18 08:26	7664-41-7	P6
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		03/28/18 12:02	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/28/18 12:02	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/28/18 12:02		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:16		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	17.3	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:53	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.15	mg/L	0.050	1	04/03/18 10:29	04/04/18 10:04	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529772	Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1	Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10424924002	

METHOD BLANK: 2875568 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/03/18 16:57	

LABORATORY CONTROL SAMPLE & LCSD: 2875569

2875570

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.3	5.3	105	106	85-115	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529771

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 MET Dissolved

Associated Lab Samples: 10424924002

METHOD BLANK: 2875565

Matrix: Water

Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/02/18 13:27	
Barium, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Copper, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Manganese, Dissolved	ug/L	ND	5.0	04/02/18 13:27	
Nickel, Dissolved	ug/L	ND	20.0	04/02/18 13:27	
Silver, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Tin, Dissolved	ug/L	ND	75.0	04/02/18 13:27	
Zinc, Dissolved	ug/L	ND	20.0	04/02/18 13:27	

LABORATORY CONTROL SAMPLE & LCSD: 2875566

2875567

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	20500	20900	103	104	85-115	2	20	
Barium, Dissolved	ug/L	1000	1020	1040	102	104	85-115	2	20	
Copper, Dissolved	ug/L	1000	985	1000	98	100	85-115	2	20	
Manganese, Dissolved	ug/L	1000	1010	1020	101	102	85-115	2	20	
Nickel, Dissolved	ug/L	1000	1010	1030	101	103	85-115	2	20	
Silver, Dissolved	ug/L	500	493	501	99	100	85-115	1	20	
Tin, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1020	1040	102	104	85-115	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch:	529767	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	10424924002		

METHOD BLANK: 2875545 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	03/30/18 17:44	

LABORATORY CONTROL SAMPLE: 2875546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875547 2875548

Parameter	Units	10425362001		2875547		2875548		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Chromium	ug/L	4.8	100	100	100	111	107	106	102	70-130	4	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529770 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10424924002

METHOD BLANK: 2875559 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Arsenic, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Beryllium, Dissolved	ug/L	ND	0.20	04/02/18 09:36	
Boron, Dissolved	ug/L	ND	5.0	04/02/18 09:36	
Cadmium, Dissolved	ug/L	ND	0.080	04/02/18 09:36	
Chromium, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Cobalt, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Lead, Dissolved	ug/L	ND	0.10	04/02/18 09:36	
Selenium, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Thallium, Dissolved	ug/L	ND	0.10	04/02/18 09:36	
Uranium-238, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Vanadium, Dissolved	ug/L	ND	1.0	04/02/18 09:36	

LABORATORY CONTROL SAMPLE & LCSD: 2875560

Parameter	Units	2875564								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Antimony, Dissolved	ug/L	100	104	104	104	104	85-115	0	20	
Arsenic, Dissolved	ug/L	100	105	104	105	104	85-115	1	20	
Beryllium, Dissolved	ug/L	100	110	109	110	109	85-115	1	20	
Boron, Dissolved	ug/L	100	106	110	106	110	85-115	4	20	
Cadmium, Dissolved	ug/L	100	106	105	106	105	85-115	1	20	
Chromium, Dissolved	ug/L	100	106	105	106	105	85-115	1	20	
Cobalt, Dissolved	ug/L	100	107	106	107	106	85-115	0	20	
Lead, Dissolved	ug/L	100	109	107	109	107	85-115	1	20	
Selenium, Dissolved	ug/L	100	107	106	107	106	85-115	1	20	
Thallium, Dissolved	ug/L	100	107	105	107	105	85-115	2	20	
Uranium-238, Dissolved	ug/L	100	111	111	111	111	85-115	0	20	
Vanadium, Dissolved	ug/L	100	103	104	103	104	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529677

Analysis Method: EPA 8270D

QC Batch Method: EPA 3520

Analysis Description: 8270D Water MSSV

Associated Lab Samples: 10424924001

METHOD BLANK: 2874915

Matrix: Water

Associated Lab Samples: 10424924001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dimethylphenol	ug/L	ND	50.0	04/03/18 17:31	
2,4-Dinitrophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Chlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Methylnaphthalene	ug/L	ND	10.0	04/03/18 17:31	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/03/18 17:31	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/03/18 17:31	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/03/18 17:31	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/03/18 17:31	
Acenaphthene	ug/L	ND	10.0	04/03/18 17:31	
Anthracene	ug/L	ND	10.0	04/03/18 17:31	
Benzo(a)pyrene	ug/L	ND	10.0	04/03/18 17:31	
Benzoic acid	ug/L	ND	50.0	04/03/18 17:31	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/03/18 17:31	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/03/18 17:31	
Butylbenzylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-butylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-octylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Diethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Dimethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Fluoranthene	ug/L	ND	10.0	04/03/18 17:31	
Fluorene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorobenzene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/03/18 17:31	
Hexachloroethane	ug/L	ND	10.0	04/03/18 17:31	
Isophorone	ug/L	ND	10.0	04/03/18 17:31	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/03/18 17:31	
Pentachlorophenol	ug/L	ND	20.0	04/03/18 17:31	
Phenanthrene	ug/L	ND	10.0	04/03/18 17:31	
Phenol	ug/L	ND	10.0	04/03/18 17:31	
Pyrene	ug/L	ND	10.0	04/03/18 17:31	
2,4,6-Tribromophenol (S)	%	81	65-125	04/03/18 17:31	
2-Fluorobiphenyl (S)	%	74	56-125	04/03/18 17:31	
2-Fluorophenol (S)	%	83	55-125	04/03/18 17:31	
Nitrobenzene-d5 (S)	%	81	60-125	04/03/18 17:31	
p-Terphenyl-d14 (S)	%	107	58-125	04/03/18 17:31	
Phenol-d6 (S)	%	87	58-125	04/03/18 17:31	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

LABORATORY CONTROL SAMPLE & LCSD: 2874916		2874917								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	41.4	42.1	83	84	74-125	2	20	
2,4-Dichlorophenol	ug/L	50	39.2	39.7	78	79	68-125	1	20	
2,4-Dimethylphenol	ug/L	50	28.9J	31J	58	62	33-125		20	
2,4-Dinitrophenol	ug/L	50	34.2	36.8	68	74	30-127	7	20	
2-Chlorophenol	ug/L	50	38.3	37.2	77	74	61-125	3	20	
2-Methylnaphthalene	ug/L	50	38.0	38.8	76	78	67-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	36.4	35.0	73	70	63-125	4	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.3	36.8	75	74	67-125	1	20	
3,3'-Dichlorobenzidine	ug/L	50	45.7J	48.1J	91	96	60-125		20	
4-Bromophenylphenyl ether	ug/L	50	43.2	43.6	86	87	75-125	1	20	
Acenaphthene	ug/L	50	40.1	40.9	80	82	74-125	2	20	
Anthracene	ug/L	50	43.5	43.9	87	88	75-125	1	20	
Benzo(a)pyrene	ug/L	50	42.7	42.4	85	85	75-125	1	20	
Benzoic acid	ug/L	50	21.9J	22.1J	44	44	30-125		20	1M
bis(2-Chloroethyl) ether	ug/L	50	35.4	34.0	71	68	55-125	4	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.0	41.6	82	83	72-129	1	20	
Butylbenzylphthalate	ug/L	50	41.2	41.2	82	82	69-127	0	20	
Di-n-butylphthalate	ug/L	50	41.5	42.0	83	84	75-125	1	20	
Di-n-octylphthalate	ug/L	50	41.6	41.4	83	83	69-131	1	20	
Diethylphthalate	ug/L	50	42.5	43.0	85	86	75-125	1	20	
Dimethylphthalate	ug/L	50	42.6	43.0	85	86	75-125	1	20	
Fluoranthene	ug/L	50	42.6	44.2	85	88	75-125	4	20	
Fluorene	ug/L	50	41.7	42.4	83	85	75-125	2	20	
Hexachlorobenzene	ug/L	50	42.0	42.3	84	85	74-125	1	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	30	31	30-125		20	
Hexachloroethane	ug/L	50	28.9	26.6	58	53	30-125	9	20	
Isophorone	ug/L	50	37.8	38.4	76	77	72-125	2	20	
N-Nitrosodiphenylamine	ug/L	50	41.5	41.7	83	83	75-125	0	20	
Pentachlorophenol	ug/L	50	35.5	36.9	71	74	52-125	4	20	
Phenanthrene	ug/L	50	43.3	43.5	87	87	75-125	1	20	
Phenol	ug/L	50	38.0	36.7	76	73	59-125	3	20	
Pyrene	ug/L	50	44.1	44.3	88	89	75-125	0	20	
2,4,6-Tribromophenol (S)	%				90	92	65-125			
2-Fluorobiphenyl (S)	%				80	82	56-125			
2-Fluorophenol (S)	%				80	77	55-125			
Nitrobenzene-d5 (S)	%				76	77	60-125			
p-Terphenyl-d14 (S)	%				99	101	58-125			
Phenol-d6 (S)	%				82	81	58-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529389

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10424924002

METHOD BLANK: 2873451

Matrix: Water

Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/02/18 10:05	B3,B6

LABORATORY CONTROL SAMPLE: 2873453

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	206	104	85-115	B3,B6

SAMPLE DUPLICATE: 2873454

Parameter	Units	10424970001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	ND	1.7J		20	B3,B6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch:	529253	Analysis Method:	EPA 180.1
QC Batch Method:	EPA 180.1	Analysis Description:	180.1 Turbidity
Associated Lab Samples:	10424924002		

METHOD BLANK: 2872494 Matrix: Water

Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/27/18 12:18	

LABORATORY CONTROL SAMPLE: 2872495

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.3	100	90-110	

SAMPLE DUPLICATE: 2872496

Parameter	Units	10424931002 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	1.4	1.5	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529843 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10424924002

METHOD BLANK: 2875787 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	03/30/18 10:31	

LABORATORY CONTROL SAMPLE: 2875788

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	90.0	90	80-120	

SAMPLE DUPLICATE: 2875789

Parameter	Units	10424826001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	82.0	94.0	14	10	D6

SAMPLE DUPLICATE: 2875790

Parameter	Units	10424826002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	30.0	42.0	33	10	D6,D8

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10424924002

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 529176	Analysis Method: SM 3500-Cr D Modified
QC Batch Method: SM 3500-Cr D Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10424924002	

METHOD BLANK: 2872178 Matrix: Water

Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/27/18 10:04	FS

LABORATORY CONTROL SAMPLE: 2872179

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	102	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2872180 2872181

Parameter	Units	10424924002		2872180		2872181		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Chromium, Hexavalent	mg/L	ND	.2	.2	ND	ND	0	0	85-115	20	FS,M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529786 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia
Associated Lab Samples: 10424924002

METHOD BLANK: 2875606 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.040	03/30/18 09:06	

LABORATORY CONTROL SAMPLE: 2875607

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875608 2875609

Parameter	Units	10424864002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	<0.019	1	1	0.98	1.0	98	103	90-110	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875610 2875611

Parameter	Units	10425125004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	18.4	10	10	30.1	33.4	117	150	90-110	10	20	M6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 140179

Analysis Method: EPA 350.1 rev. 2 (1993)

QC Batch Method: EPA 350.1 rev. 2 (1993)

Analysis Description: 350.1 Ammonia Distilled

Associated Lab Samples: 10424924002

METHOD BLANK: 555078

Matrix: Water

Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/10/18 08:10	

LABORATORY CONTROL SAMPLE: 555079

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10.3	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 555080

555081

Parameter	Units	10424924002		555080		555081		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Nitrogen, Ammonia	mg/L	44.2	10	10	55.0	60.0	108	158	90-110	9	10 P6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 529431 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10424924002

METHOD BLANK: 2873588 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/28/18 12:03	FS
Nitrite as N	mg/L	ND	0.020	03/28/18 12:03	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/28/18 12:03	FS

LABORATORY CONTROL SAMPLE: 2873589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.97	97	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2873590 2873591

Parameter	Units	10424968001		2873590		2873591		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Nitrite as N	mg/L	0.051	1	1	0.99	1.0	94	98	90-110	4	20		
Nitrogen, NO2 plus NO3	mg/L	9.7	20	20	28.4	28.2	93	92	90-110	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 19623

Analysis Method: EPA 9016

QC Batch Method: EPA 9016

Analysis Description: 9016 Free Cyanide

Associated Lab Samples: 10424924001, 10424924002

METHOD BLANK: 77969

Matrix: Water

Associated Lab Samples: 10424924001, 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971

77972

Parameter	Units	10424606001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide, Free	ug/L	ND	150	150	160	160	106	106	80-120	0	11	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

QC Batch: 530296

Analysis Method: SM 4500-CN-E

QC Batch Method: SM 4500-CN-E

Analysis Description: SM4500CN-E Cyanide

Associated Lab Samples: 10424924001, 10424924002

METHOD BLANK: 2878424

Matrix: Water

Associated Lab Samples: 10424924001, 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/03/18 12:40	

LABORATORY CONTROL SAMPLE: 2878425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	241	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878426 2878427

Parameter	Units	10423797004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	1.5 mg/L	250	250	1950	1840	172	128	80-120	6	30	H3,M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878428 2878429

Parameter	Units	10425152001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	38.4	250	250	269	268	92	92	80-120	0	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

QC Batch: 530338 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10424924002

METHOD BLANK: 2878509 Matrix: Water
Associated Lab Samples: 10424924002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/03/18 16:23	

LABORATORY CONTROL SAMPLE: 2878510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.1	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878511 2878512

Parameter	Units	10424908001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Phosphorus	mg/L	ND	1	1	1.1	1.2	108	115	80-120	7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878513 2878514

Parameter	Units	10425827001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Phosphorus	mg/L	ND	1	1	1.1	1.0	107	103	80-120	4	30	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10424924

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-M Pace Analytical Services - Minneapolis
PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 529937
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 529951
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 530440
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
B3 The dissolved oxygen depletion of the dilution water blank exceeded 0.2 mg/L.
B6 The calculated seed correction exceeded the range of 0.6 to 1.0 mg/L.
D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
D8 The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

ANALYTE QUALIFIERS

- FS The sample was filtered in the laboratory prior to analysis.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10424924

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10424924002	FD-SB-A3	EPA 200.7	529771	EPA 200.7	529951
10424924002	FD-SB-A3	EPA 200.8	529767	EPA 200.8	529968
10424924002	FD-SB-A3	EPA 200.8	529770	EPA 200.8	529937
10424924002	FD-SB-A3	EPA 245.1	529772	EPA 245.1	530149
10424924001	FD-SB-B4	EPA 3520	529677	EPA 8270D	530440
10424924002	FD-SB-A3	Hach 10360	529389	Hach 10360 Rev 1.1	529615
10424924002	FD-SB-A3	EPA 180.1	529253		
10424924002	FD-SB-A3	SM 2540D	529843		
10424924002	FD-SB-A3	SM 4500-H+B	529922		
10424924002	FD-SB-A3	EPA 300.0	529627		
10424924002	FD-SB-A3	SM 3500-Cr D Modified	529176		
10424924002	FD-SB-A3	EPA 350.1	529786		
10424924002	FD-SB-A3	EPA 350.1 rev. 2 (1993)	140179	EPA 350.1 rev. 2 (1993)	140246
10424924002	FD-SB-A3	EPA 353.2	529431		
10424924001	FD-SB-B4	EPA 9016	19623	EPA 9016	19643
10424924002	FD-SB-A3	EPA 9016	19623	EPA 9016	19643
10424924001	FD-SB-B4	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10424924002	FD-SB-A3	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10424924002	FD-SB-A3	SM 4500-P B	530338	SM 4500-P E	530391

REPORT OF LABORATORY ANALYSIS

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March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent <i>(unfiltered)</i>	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans EPA 1613B	
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs EPA 8270C	
PCBs EPA 8082	
PFCs EPA 537	
VOCs EPA 8260 LL/SIM	
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness detrmination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270-SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids EPA 552.2	

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Sample Condition Upon Receipt **Client Name:** Pace FSD **Project #:** **WO# : 10424924**

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

PM: BM2 **Due Date: 04/10/18**
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: G87A9155100842

Cooler Temp Read (°C): 4.9 **Cooler Temp Corrected (°C):** 5.1 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** BYL 3/27/18

USDA Regulated Soil (N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No?	5. <u>not time on cont. for hex chrome</u>
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>only partial analysis of list a possible assisted on COC</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1</u> <u>2 3/2</u> <u>1/1</u> <u>1/1</u> <u>NAOH for Sample 2 out of range</u>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: Limited parameters due to limited volume received.

Project Manager Review: BA VC **Date:** 3/29/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

WO#: 4610068

Samples were sent



4610068

State Of Origin: MN



Workorder: 10424924

Workorder name: 18-00383 MPCA Freeway LF Water

Owner Received Date: 3/27/2018 Results Requested By: 4/10/2018

Report To		Subcontract To					Requested Analysis													
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Grand Rapids 5560 Corporate Exchange Court Grand Rapids, MI 49512 USA Phone (616)975-4500					<div style="float: right; text-align: right;">19-11</div>													
							Free Cyanide Method 9016													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	Preserved Containers													
1	FD-SB-B4	PS	3/26/2018 15:00	10424924001	Water	3														
2	FD-SB-A3	PS	3/26/2018 14:00	10424924002	Water	3														
3																				
4																				
5																				
Transfers		Released By		Date/Time		Received By		Date/Time		Comments										
1		<i>Angela Pace</i>		3/28/18		<i>1520 R...</i>		3/27/18												
2																				
3																				
Cooler Temperature on Receipt			°C	Custody Seal Y or N			Received on Ice Y or N			Samples Intact Y or N										

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: <u>Pace Minnesota</u>	Work Order #: <u>4610068</u>
Receipt Record Page/Line #: <u>19-11</u>	Project Chemist: _____ Sample #: _____

Recorded by (initials/date): <u>TS 3/29/18</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received: <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) <input type="checkbox"/> Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> Other (# _____)	<input type="checkbox"/> See Additional Cooler Information Form
--	--	------------------------	--	---

Cooler #	Time			
<u>Blue</u>	<u>1150</u>			
Custody Seals:				
<input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact				
Coolant Type:				
<input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None				
Coolant Location:				
<input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom				
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If Present, Temperature Blank Location is:				
<input type="checkbox"/> Representative <input type="checkbox"/> Not Representative				
Observed °C	Correction Factor °C	Actual °C		
Temp Blank:				
Sample 1:	<u>1.1</u>	<u>1</u>	<u>1.1</u>	
Sample 2:	<u>2.7</u>	<u>1</u>	<u>2.7</u>	
Sample 3:	<u>2.6</u>	<u>1</u>	<u>2.6</u>	
3 Sample Average °C: _____				
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?				

Cooler #	Time			
Custody Seals:				
<input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact				
Coolant Type:				
<input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None				
Coolant Location:				
<input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom				
Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Present, Temperature Blank Location is:				
<input type="checkbox"/> Representative <input type="checkbox"/> Not Representative				
Observed °C	Correction Factor °C	Actual °C		
Temp Blank:				
Sample 1:				
Sample 2:				
Sample 3:				
3 Sample Average °C: _____				
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?				

Cooler #	Time			
Custody Seals:				
<input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact				
Coolant Type:				
<input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None				
Coolant Location:				
<input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom				
Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Present, Temperature Blank Location is:				
<input type="checkbox"/> Representative <input type="checkbox"/> Not Representative				
Observed °C	Correction Factor °C	Actual °C		
Temp Blank:				
Sample 1:				
Sample 2:				
Sample 3:				
3 Sample Average °C: _____				
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?				

Cooler #	Time			
Custody Seals:				
<input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact				
Coolant Type:				
<input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None				
Coolant Location:				
<input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom				
Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Present, Temperature Blank Location is:				
<input type="checkbox"/> Representative <input type="checkbox"/> Not Representative				
Observed °C	Correction Factor °C	Actual °C		
Temp Blank:				
Sample 1:				
Sample 2:				
Sample 3:				
3 Sample Average °C: _____				
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?				

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes No

Chain of Custody record(s)? If No, Initiated By _____
Received for Lab Signed/Date/Time?

Shipping document?

Other _____

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes No

Analysis Requested?

Sample ID matches COC?

Sample Date and Time matches COC?

Container type completed on COC?

All container types indicated are received?

Sample Condition Summary

N/A Yes No

Broken containers/lids?

Missing or incomplete labels?

Illegible information on labels?

Low volume received?

Inappropriate or non-Pace containers received?

VOC vials / TOX containers have headspace?

Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6° C?

If either is ≥6° C, was thermal preservation required?
If "Yes", Project Chemist Approval Initials: _____

If "Yes" Completed Non Con Cooler - Cont Inventory Form?

Completed Sample Preservation Verification Form?

Samples chemically preserved correctly?
If "No", added orange tag?

Received pre-preserved VOC soils?
 MeOH Na₂SO₄

Check for Short Hold-Time Prep/Analyses

Bacteriological

Air Bags

EnCores / Methanol Pre-Preserved

Formaldehyde/Aldehyde

Green-tagged containers

Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:

COPIES OF COC TO LAB AREA(S)

NONE RECEIVED

RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
<u>TS 3/29/18</u>	<u>TS 3/29/18</u>	Yes / No



AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: Pace Minnesota Work Order #: 4610068
 Receipt Log #: 19-11 Completed By (initials/date): TS 8/29/18 Project Manager: _____

COC ID #														
Adjusted by: _____														
Date: _____														
Container Type	5 / 23		4		13		6		15					
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2					
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1	✓	10												
COC Line #2	✓	10												
COC Line #3														
COC Line #4														
COC Line #5														
COC Line #6														
COC Line #7														
COC Line #8														
COC Line #9														
COC Line #10														
COC Line #11														
COC Line #12														

pH Strip Reagent or Lot #
 HC727135
 Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID #														
Adjusted by: _____														
Date: _____														
Container Type	5 / 23		4		13		6		15					
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2					
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1														
COC Line #2														
COC Line #3														
COC Line #4														
COC Line #5														
COC Line #6														
COC Line #7														
COC Line #8														
COC Line #9														
COC Line #10														
COC Line #11														
COC Line #12														

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____

SAMPLE RECEIVING NON-CONFORMANCE REPORT

Client Pace Minnesota	Work Order # 4610068
Receipt Log # 19-11	Completed By (initials/date) PS 3/29/18
Project Chemist	

List non-conformance issues associated with this work order in the chart below/left. Identify discrepancies between the COC and sample tags in the chart below/right. Add comments as needed.

COC ID #	Line #	Type of Problem											COC					Sample Tag					Line Item Comments	
		Discrepancy	Missing Container	Broken Container	Label Missing / Incomplete	Label Illegible	Low Volume	Inappropriate Container	Headspace	Not Listed on COC	Preservation	Sample Field ID	Date Sampled	Time Sampled	Container Type	Qty	Sample Field ID	Date Sampled	Time Sampled	Container Type	Qty			
	1																							See pH form
	2																							↓

General Comments:

Project Chemist (initials/date)

Chain of Custody

WO#: 12106457

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: M Owner Received Date: 3/27/2018 Results Requested By: 4/10/2018



Page 36 of 37

Workorder: 10424924 Workorder Name: 18-00383 MPCA Freeway LF Water

Report To Subcontract To Requested Analysis

Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452	Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042
--	---

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Nitrogen, unionized ammonia, as N	LAB USE ONLY
						H2SO4						
1	FD-SB-A3	PS	3/26/2018 14:00	10424924002	Water	1					X	
2												
3												
4												
5												

					Comments
Transfers	Released By	Date/Time	Received By	Date/Time	
1	[Signature]	3/28/18 17:35	[Signature]	3-28-18 19:00	
2	[Signature]	3-28-18 23:15	B. Mathew	3/29/18 06:45	
3					

Cooler Temperature on Receipt 3.8 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: MPCA FSD P&S1-MN/AD

Project #: **WO#: 12106457**
 PM: HRZ Due Date: 04/10/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

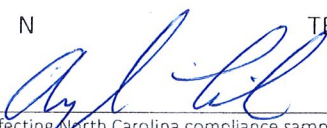
Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.5 Cooler Temp Corrected °C: 3.8 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 3-28-18 PC

Comments: Bm 3/29/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review:  Date: 3/29/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

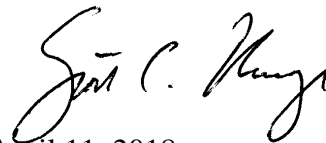
PaceProject#: 10425249
Sample Receipt Date: 03/28/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 11, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

April 11, 2018

DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 76-105%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 111-114% with a relative percent difference of 2.7%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO#: 10425249



Chain-of-Custody Form

Work Order Number:

Turnaround Time:

1 of

FOR LAB USE ONLY

Lab Work Order Sticker

Facility Code: MPCA Freeway LF waters		Program Code (MDH Lab Only):	Lab Name:
Project Name: MPCA Freeway LF waters		Project Task Code:	Address: 18-00383
Project Manager:		Epic Profile #38716	
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

SAMPLE DETAILS										ANALYSIS REQUESTED									
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				PRESERV.							
Sample-Routine Sample	QC-FB=Field Blank Sample	DW=Drinking Water	AR=Air	Wtr-Ground=Groundwater															
S-IVP=Integrated Vertical Profile Sample	QC-FR=Field Replicate Sample	NW=Non-potable Water	BL=Biological Material	Wtr-Surf=Surface Water															
S-CWOP=Composite Sample	QC-TB=Trip Blank Sample	SD=Soil/Solid	OT=Other	QC-BLANK=Artificial Blank Water															
		WP=Wipe	TS=Tissue	Leachate=Leachate Sample															
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS						Lab Sample No.	#
Field Blank	FB	3/28/18	1000			G		Blank			16	X	LIST A					001	1
F.D-SB-B3	S	3/28/18	1300			G		Ground			41		LIST A/B/C					002	2
DATA 3/28/18																			

Sampled By: David Andersen Sampler's Signature: David Andersen Phone #: _____

Receiving Comments:			
Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <u>David Andersen / Pace Analytical</u>	<u>3/28/18 / 1525</u>	<u>UN PAEE 3.28.18</u>	<u>1525</u>

11.0 °C
12.2 °C
11.5 °C

Sample Condition Upon Receipt

Client Name: MPCA - Field Project #: MD 3/28/18

WO#: 10425249
 PM: SCU Due Date: 04/11/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 10.8, 12.0, 11.3 Cooler Temp Corrected (°C): 11.0, 12.2, 11.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: to 2 Date and Initials of Person Examining Contents: MD 3/28/18

USDA Regulated Soil N/A, water sample
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: Nathan Boberg Date: 3/29/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	
	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	Field Blank		
Lab Sample ID	10425249001		
Filename	U180405B_14		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/28/2018 10:00
ICAL ID	U180405	Received	03/28/2018 15:25
CCal Filename(s)	U180405B_12	Extracted	04/02/2018 15:10
Method Blank ID	BLANK-61476	Analyzed	04/05/2018 22:38

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	76
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	88

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-B3		
Lab Sample ID	10425249002		
Filename	U180405B_15		
Injected By	SMT		
Total Amount Extracted	508 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/28/2018 13:00
ICAL ID	U180405	Received	03/28/2018 15:25
CCal Filename(s)	U180405B_12	Extracted	04/02/2018 15:10
Method Blank ID	BLANK-61476	Analyzed	04/05/2018 23:27

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	105
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	112

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61476	Matrix	Water
Filename	F180406A_09	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/02/2018 15:10
ICAL ID	F180405	Analyzed	04/06/2018 14:07
CCal Filename(s)	F180406A_01	Injected By	ZMS

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	78
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	100

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61477	Matrix	Water
Filename	F180406A_06	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	04/02/2018 15:10
ICAL ID	F180405	Analyzed	04/06/2018 11:51
CCal Filename	F180406A_01	Injected By	ZMS
Method Blank ID	BLANK-61476		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	114
2,3,7,8-TCDD-37Cl4	10	10	3.7	15.8	101
2,3,7,8-TCDD-13C	100	88	25.0	141.0	88

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61478	Matrix	Water
Filename	F180406A_07	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	04/02/2018 15:10
ICAL ID	F180405	Analyzed	04/06/2018 12:36
CCal Filename	F180406A_01	Injected By	ZMS
Method Blank ID	BLANK-61476		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	111
2,3,7,8-TCDD-37Cl4	10	10	3.7	15.8	102
2,3,7,8-TCDD-13C	100	91	25.0	141.0	91

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61477
 Spike 1 Filename F180406A_06

Spike 2 ID LCSD-61478
 Spike 2 Filename F180406A_07

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	114	111	2.7

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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April 19, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 28, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137
 Mississippi Certification #: MN00064
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon NwTPH Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DW Certification #: 9952 C
 West Virginia DEP Certification #: 382
 Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 Alaska Certification UST-107
 California Certification #2973
 California Certification #2973
 Montana Certificate #CERT0103
 Alaska Certification #MN01084
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
 North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007
 Nevada DNR #MN010842018-1
 Oklahoma Department of Environmental Quality
 California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
 Georgia Certification #: C040
 Guam Certification
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10425264001	Field Blank	Water	03/28/18 10:00	03/28/18 15:25
10425264002	FD-SB-B3	Water	03/28/18 13:00	03/28/18 15:25

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10425264001	Field Blank	EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	AT1	38	PASI-M
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	JFP	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
10425264002	FD-SB-B3	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	1	PASI-O
		EPA 552.3	LJM	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	IP	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	38	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-ClO2	AGS	1	PASI-O
		SM 4500-H+B	JFP	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	KEO	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: Field Blank **Lab ID: 10425264001** Collected: 03/28/18 10:00 Received: 03/28/18 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
------------	---------	-------	--------------	----	----------	----------	---------	------

8081B GCS Pesticides

Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C

Aldrin	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	309-00-2	
alpha-BHC	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	319-84-6	
beta-BHC	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	319-85-7	
delta-BHC	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	58-89-9	
Chlordane (Technical)	ND	ug/L	0.52	1	03/29/18 14:03	04/06/18 16:11	57-74-9	
alpha-Chlordane	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	5103-71-9	
gamma-Chlordane	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	5103-74-2	
4,4'-DDD	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	72-54-8	
4,4'-DDE	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	72-55-9	
4,4'-DDT	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	50-29-3	
Dieldrin	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	60-57-1	
Endosulfan I	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	959-98-8	
Endosulfan II	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	1031-07-8	
Endrin	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	72-20-8	
Endrin aldehyde	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	7421-93-4	
Endrin ketone	ND	ug/L	0.10	1	03/29/18 14:03	04/06/18 16:11	53494-70-5	
Heptachlor	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	76-44-8	
Heptachlor epoxide	ND	ug/L	0.052	1	03/29/18 14:03	04/06/18 16:11	1024-57-3	
Methoxychlor	ND	ug/L	0.52	1	03/29/18 14:03	04/06/18 16:11	72-43-5	
Toxaphene	ND	ug/L	1.5	1	03/29/18 14:03	04/06/18 16:11	8001-35-2	

Surrogates

Tetrachloro-m-xylene (S)	86	%	62-125	1	03/29/18 14:03	04/06/18 16:11	877-09-8	
Decachlorobiphenyl (S)	59	%	30-143	1	03/29/18 14:03	04/06/18 16:11	2051-24-3	

8082A GCS PCB

Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C

PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	03/29/18 14:04	04/03/18 11:36	11100-14-4	

Surrogates

Tetrachloro-m-xylene (S)	63	%	30-125	1	03/29/18 14:04	04/03/18 11:36	877-09-8	
Decachlorobiphenyl (S)	49	%	30-125	1	03/29/18 14:04	04/03/18 11:36	2051-24-3	

200.7 MET ICP, Dissolved

Analytical Method: EPA 200.7 Preparation Method: EPA 200.7

Aluminum, Dissolved	ND	ug/L	200	1	03/30/18 11:48	04/02/18 13:43	7429-90-5	
Barium, Dissolved	936	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:43	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:43	7440-50-8	
Manganese, Dissolved	430	ug/L	5.0	1	03/30/18 11:48	04/02/18 13:43	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:43	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:43	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: Field Blank		Lab ID: 10425264001	Collected: 03/28/18 10:00	Received: 03/28/18 15:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Tin, Dissolved	ND	ug/L	75.0	1	03/30/18 11:48	04/02/18 13:43	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:43	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	ND	ug/L	0.50	1	03/30/18 13:50	03/30/18 17:47	7440-47-3	
Total Hardness by 2340B	ND	ug/L	141	1	03/30/18 13:50	03/30/18 17:47		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/18 11:48	04/02/18 09:38	7440-41-7	
Boron, Dissolved	ND	ug/L	5.0	1	03/30/18 11:48	04/02/18 09:38	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/18 11:48	04/02/18 09:38	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/30/18 11:48	04/02/18 09:38	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/18 11:48	04/02/18 09:38	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	04/02/18 09:38	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/30/18 11:48	04/02/18 09:38	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/18 10:00	04/03/18 17:06	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	83-32-9	
Anthracene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	50-32-8	
Benzoic acid	ND	ug/L	52.1	1	03/29/18 14:54	04/04/18 21:10	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.1	1	03/29/18 14:54	04/04/18 21:10	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.1	1	03/29/18 14:54	04/04/18 21:10	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	206-44-0	
Fluorene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.1	1	03/29/18 14:54	04/04/18 21:10	77-47-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: Field Blank	Lab ID: 10425264001	Collected: 03/28/18 10:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Hexachloroethane	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	67-72-1	
Isophorone	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.8	1	03/29/18 14:54	04/04/18 21:10		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	86-30-6	
Pentachlorophenol	ND	ug/L	20.8	1	03/29/18 14:54	04/04/18 21:10	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	85-01-8	
Phenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	108-95-2	
Pyrene	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	03/29/18 14:54	04/04/18 21:10	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	74	%.	60-125	1	03/29/18 14:54	04/04/18 21:10	4165-60-0	
2-Fluorobiphenyl (S)	60	%.	56-125	1	03/29/18 14:54	04/04/18 21:10	321-60-8	
p-Terphenyl-d14 (S)	106	%.	58-125	1	03/29/18 14:54	04/04/18 21:10	1718-51-0	
Phenol-d6 (S)	85	%.	58-125	1	03/29/18 14:54	04/04/18 21:10	13127-88-3	
2-Fluorophenol (S)	76	%.	55-125	1	03/29/18 14:54	04/04/18 21:10	367-12-4	
2,4,6-Tribromophenol (S)	77	%.	65-125	1	03/29/18 14:54	04/04/18 21:10	118-79-6	
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	ND	mg/L	2.0	1	03/29/18 12:02	04/03/18 10:32		B2,B4, B6
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.2	1		04/06/18 12:58		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	0.39	NTU	0.30	1		03/29/18 15:27		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	ND	mg/L	10.0	1		04/03/18 16:10		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	8.1	Std. Units	0.10	1		03/30/18 16:51		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		04/04/18 10:29		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.050	1		03/31/18 02:22	16984-48-8	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/29/18 09:06		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	ND	mg/L	0.10	1	04/04/18 10:00	04/06/18 09:51	7664-41-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: Field Blank		Lab ID: 10425264001		Collected: 03/28/18 10:00	Received: 03/28/18 15:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	ND	mg/L	0.020	1		03/29/18 14:13	14797-55-8	
Nitrite as N	ND	mg/L	0.020	1		03/29/18 14:13	14797-65-0	
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		03/29/18 14:13		
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:19		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:54	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	ND	mg/L	0.050	1	04/06/18 10:41	04/06/18 13:18	7723-14-0	
Sample: FD-SB-B3		Lab ID: 10425264002		Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates		Analytical Method: EPA 531.1						
Aldicarb	ND	ug/L	2.0	1		04/03/18 20:17	116-06-3	
Carbofuran	ND	ug/L	2.0	1		04/03/18 20:17	1563-66-2	
Surrogates								
BDMC (S)	94	%	80-120	1		04/03/18 20:17		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		04/04/18 16:27		
549.2 HPLC Paraquat Diquat		Analytical Method: EPA 549.2 Preparation Method: EPA 549.2						
Diquat	ND	ug/L	0.40	1	04/04/18 23:02	04/05/18 19:38	85-00-7	
552.3 Haloacetic Acids		Analytical Method: EPA 552.3 Preparation Method: EPA 552.3						
Dibromoacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/04/18 10:30	04/09/18 21:47	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	143	%	70-130	1	04/04/18 10:30	04/09/18 21:47	600-05-5	S3
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/04/18 07:55	04/04/18 22:08	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/04/18 07:55	04/04/18 22:08	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	128	%	30-150	1	04/04/18 07:55	04/04/18 22:08	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3	Lab ID: 10425264002	Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/05/18 10:42	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/04/18 15:22	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	309-00-2	
alpha-BHC	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	319-84-6	
beta-BHC	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	319-85-7	
delta-BHC	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	58-89-9	
Chlordane (Technical)	ND	ug/L	0.53	1	03/29/18 14:03	04/06/18 15:53	57-74-9	
alpha-Chlordane	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	5103-71-9	
gamma-Chlordane	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	5103-74-2	
4,4'-DDD	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	72-54-8	
4,4'-DDE	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	72-55-9	
4,4'-DDT	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	50-29-3	
Dieldrin	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	60-57-1	
Endosulfan I	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	959-98-8	
Endosulfan II	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	1031-07-8	
Endrin	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	72-20-8	
Endrin aldehyde	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	7421-93-4	
Endrin ketone	ND	ug/L	0.11	1	03/29/18 14:03	04/06/18 15:53	53494-70-5	
Heptachlor	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	76-44-8	
Heptachlor epoxide	ND	ug/L	0.053	1	03/29/18 14:03	04/06/18 15:53	1024-57-3	
Methoxychlor	ND	ug/L	0.53	1	03/29/18 14:03	04/06/18 15:53	72-43-5	
Toxaphene	ND	ug/L	1.6	1	03/29/18 14:03	04/06/18 15:53	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	77	%.	62-125	1	03/29/18 14:03	04/06/18 15:53	877-09-8	
Decachlorobiphenyl (S)	54	%.	30-143	1	03/29/18 14:03	04/06/18 15:53	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	12672-29-6	
PCB-1254 (Aroclor 1254)	0.31	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	03/29/18 14:04	04/03/18 11:52	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	69	%.	30-125	1	03/29/18 14:04	04/03/18 11:52	877-09-8	
Decachlorobiphenyl (S)	46	%.	30-125	1	03/29/18 14:04	04/03/18 11:52	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3	Lab ID: 10425264002	Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8315A GCSV Aldehydes Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	03/30/18 11:30	03/30/18 17:45	50-00-0	
8316 W GCSV Acrylamide Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/03/18 16:45	79-06-1	
200.7 MET ICP, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/30/18 11:48	04/02/18 13:47	7429-90-5	
Barium, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:47	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:47	7440-50-8	
Manganese, Dissolved	ND	ug/L	5.0	1	03/30/18 11:48	04/02/18 13:47	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:47	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/30/18 11:48	04/02/18 13:47	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/30/18 11:48	04/02/18 13:47	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	03/30/18 11:48	04/02/18 13:47	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	10.4	ug/L	2.5	5	03/30/18 13:50	03/30/18 18:16	7440-47-3	
Total Hardness by 2340B	1280000	ug/L	14100	100	03/30/18 13:50	03/30/18 18:19		
200.8 MET ICPMS, Dissolved Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-36-0	
Arsenic, Dissolved	1.2	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/18 11:48	03/30/18 13:15	7440-41-7	
Boron, Dissolved	51900	ug/L	1000	200	03/30/18 11:48	03/30/18 16:22	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/18 11:48	03/30/18 13:15	7440-43-9	
Chromium, Dissolved	3.2	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-47-3	
Cobalt, Dissolved	3.8	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-48-4	
Lead, Dissolved	1.6	ug/L	0.10	1	03/30/18 11:48	03/30/18 13:15	7439-92-1	
Selenium, Dissolved	0.79	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/18 11:48	03/30/18 13:15	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/30/18 11:48	03/30/18 13:15	7440-61-1	
Vanadium, Dissolved	1.3	ug/L	1.0	1	03/30/18 11:48	03/30/18 13:15	7440-62-2	
245.1 Mercury, Dissolved Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/18 10:00	04/03/18 17:08	7439-97-6	
548.1 GCS Endothall Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/04/18 16:08	04/11/18 15:17		L1,L2
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	83-32-9	
Anthracene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	120-12-7	
Benzo(a)pyrene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	50-32-8	
Benzoic acid	ND	ug/L	256	5	03/29/18 14:54	04/05/18 14:21	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	101-55-3	
Butylbenzylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	85-68-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3 **Lab ID: 10425264002** Collected: 03/28/18 13:00 Received: 03/28/18 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

bis(2-Chloroethyl) ether	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	111-44-4	
2-Chlorophenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	256	5	03/29/18 14:54	04/05/18 14:21	91-94-1	
2,4-Dichlorophenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	120-83-2	
Diethylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	84-66-2	
2,4-Dimethylphenol	ND	ug/L	256	5	03/29/18 14:54	04/05/18 14:21	105-67-9	
Dimethylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	131-11-3	
Di-n-butylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	84-74-2	
2,4-Dinitrophenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	51-28-5	
Di-n-octylphthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	117-81-7	
Fluoranthene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	206-44-0	
Fluorene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	86-73-7	
Hexachlorobenzene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	256	5	03/29/18 14:54	04/05/18 14:21	77-47-4	
Hexachloroethane	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	67-72-1	
Isophorone	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	78-59-1	
2-Methylnaphthalene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	103	5	03/29/18 14:54	04/05/18 14:21		
N-Nitrosodiphenylamine	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	86-30-6	
Pentachlorophenol	ND	ug/L	103	5	03/29/18 14:54	04/05/18 14:21	87-86-5	
Phenanthrene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	85-01-8	
Phenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	108-95-2	
Pyrene	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	51.3	5	03/29/18 14:54	04/05/18 14:21	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	77	%	60-125	5	03/29/18 14:54	04/05/18 14:21	4165-60-0	D3
2-Fluorobiphenyl (S)	68	%	56-125	5	03/29/18 14:54	04/05/18 14:21	321-60-8	
p-Terphenyl-d14 (S)	78	%	58-125	5	03/29/18 14:54	04/05/18 14:21	1718-51-0	
Phenol-d6 (S)	81	%	58-125	5	03/29/18 14:54	04/05/18 14:21	13127-88-3	
2-Fluorophenol (S)	76	%	55-125	5	03/29/18 14:54	04/05/18 14:21	367-12-4	
2,4,6-Tribromophenol (S)	103	%	65-125	5	03/29/18 14:54	04/05/18 14:21	118-79-6	

524.2 MSV

Analytical Method: EPA 524.2

Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/06/18 17:54		
Surrogates								
4-Bromofluorobenzene (S)	103	%	75-125	1		04/06/18 17:54	460-00-4	
Toluene-d8 (S)	98	%	75-125	1		04/06/18 17:54	2037-26-5	
1,2-Dichloroethane-d4 (S)	98	%	75-125	1		04/06/18 17:54	17060-07-0	

Field Data

Analytical Method:

Field pH	6.9	Std. Units		1		04/17/18 08:16		
Field Temperature	11.0	deg C		1		04/17/18 08:16		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Sample: FD-SB-B3	Lab ID: 10425264002	Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	12.1	mg/L	6.0	3	03/29/18 12:02	04/03/18 10:35		B4,B6
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.4	1		04/06/18 12:58		1M
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	416	NTU	15.0	50		03/29/18 15:32		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	113	mg/L	10.0	1		04/03/18 16:10		
4500ClO2 Chlorine Dioxide								
Analytical Method: SM 4500-ClO2								
Chlorine Dioxide	ND	mg/L	0.10	1		04/06/18 13:42		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.9	Std. Units	0.10	1		03/30/18 16:56		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	ND	mg/L	0.010	1		04/04/18 10:29		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	167	mg/L	6.0	5		03/31/18 11:00	16887-00-6	
Fluoride	ND	mg/L	0.050	1		03/31/18 04:25	16984-48-8	
300.1 Oxihalide IC Anions 14d								
Analytical Method: EPA 300.1								
Chlorite	ND	ug/L	500	100		04/02/18 04:16		D3
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/29/18 09:06		FS,M3
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.052	mg/L	0.010	1		04/17/18 08:17		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	32.8	mg/L	0.50	5	04/04/18 10:00	04/06/18 10:04	7664-41-7	M1
353.2 Nitrate + Nitrite								
Analytical Method: EPA 353.2								
Nitrate as N	0.021	mg/L	0.020	1		03/29/18 14:14	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		03/29/18 14:14	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.021	mg/L	0.020	1		03/29/18 14:14		FS
9016 Cyanide, Free								
Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/05/18 16:15	04/05/18 17:19		

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3		Lab ID: 10425264002		Collected: 03/28/18 13:00	Received: 03/28/18 15:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	26.8	ug/L	10.0	1	04/03/18 09:46	04/03/18 12:56	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.53	mg/L	0.050	1	04/06/18 10:41	04/06/18 13:19	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 436885 Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1 Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10425264002

METHOD BLANK: 2372516 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	04/03/18 05:37	
Carbofuran	ug/L	ND	2.0	04/03/18 05:37	
BDMC (S)	%	93	80-120	04/03/18 05:37	

LABORATORY CONTROL SAMPLE: 2372517

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	9.2	92	80-120	
Carbofuran	ug/L	10	10.6	106	80-120	
BDMC (S)	%			101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2372518 2372519

Parameter	Units	35382635001		2372519		MS		MSD		% Rec Limits	Max		Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec	RPD		RPD		
Aldicarb	ug/L	<0.64	10	10	9.0	8.4	90	84	80-120	7	20		
Carbofuran	ug/L	<0.32	10	10	13.2	14.6	132	146	80-120	10	20	M1	
BDMC (S)	%						108	100	80-120				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 437576 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10425264002

METHOD BLANK: 2375438 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/04/18 11:18	

LABORATORY CONTROL SAMPLE: 2375439

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	46.9	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375440 2375441

Parameter	Units	35383136002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Glyphosate	ug/L	4.2U	50	50	50.8	51.9	102	104	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375442 2375443

Parameter	Units	4610024001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Glyphosate	ug/L	<6.0	50	50	53.0	54.6	106	109	80-120	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 435508 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10425264002

METHOD BLANK: 2011284 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/04/18 13:46	

LABORATORY CONTROL SAMPLE: 2011285

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	56.4	113	79-111	L3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011376 2011377

Parameter	Units	60266710003 Result	MS		MSD		% Rec		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result	% Rec	% Rec				
Methanol	mg/L	ND	50	50	46.8	46.4	94	93	43-138	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 435082 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10425264002

METHOD BLANK: 2009743 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/04/18 14:18	

LABORATORY CONTROL SAMPLE: 2009744

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	27.5	110	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009947 2009948

Parameter	Units	92378674025 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Ethylene glycol	mg/L	ND	25	25	24.5	25.5	96	100	38-154	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2009949 2009950

Parameter	Units	92378674031 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Ethylene glycol	mg/L	ND	25	25	23.2	26.3	91	103	38-154	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 19422

Analysis Method: EPA 8316

QC Batch Method: EPA 8316

Analysis Description: 8316 W GCSV Acrylamide

Associated Lab Samples: 10425264002

METHOD BLANK: 77113

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/03/18 16:28	

LABORATORY CONTROL SAMPLE: 77114

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	882	88	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77115

77116

Parameter	Units	10425264002		77115		77116		% Rec Limits	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Acrylamide	ug/L	ND	1000	1000	939	903	94	90	78-135	4	16

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529772

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury - Dissolved

Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875568

Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/03/18 16:57	

LABORATORY CONTROL SAMPLE & LCSD: 2875569

2875570

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.3	5.3	105	106	85-115	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529771 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
 Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875565 Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/02/18 13:27	
Barium, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Copper, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Manganese, Dissolved	ug/L	ND	5.0	04/02/18 13:27	
Nickel, Dissolved	ug/L	ND	20.0	04/02/18 13:27	
Silver, Dissolved	ug/L	ND	10.0	04/02/18 13:27	
Tin, Dissolved	ug/L	ND	75.0	04/02/18 13:27	
Zinc, Dissolved	ug/L	ND	20.0	04/02/18 13:27	

LABORATORY CONTROL SAMPLE & LCSD: 2875566 2875567

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	20500	20900	103	104	85-115	2	20	
Barium, Dissolved	ug/L	1000	1020	1040	102	104	85-115	2	20	
Copper, Dissolved	ug/L	1000	985	1000	98	100	85-115	2	20	
Manganese, Dissolved	ug/L	1000	1010	1020	101	102	85-115	2	20	
Nickel, Dissolved	ug/L	1000	1010	1030	101	103	85-115	2	20	
Silver, Dissolved	ug/L	500	493	501	99	100	85-115	1	20	
Tin, Dissolved	ug/L	1000	1020	1020	102	102	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1020	1040	102	104	85-115	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529767 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875545 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	03/30/18 17:44	

LABORATORY CONTROL SAMPLE: 2875546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875547 2875548

Parameter	Units	10425362001		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Chromium	ug/L	4.8	100	100	100	111	107	106	102	70-130	4	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529770 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875559 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Arsenic, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Beryllium, Dissolved	ug/L	ND	0.20	04/02/18 09:36	
Boron, Dissolved	ug/L	ND	5.0	04/02/18 09:36	
Cadmium, Dissolved	ug/L	ND	0.080	04/02/18 09:36	
Chromium, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Cobalt, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Lead, Dissolved	ug/L	ND	0.10	04/02/18 09:36	
Selenium, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Thallium, Dissolved	ug/L	ND	0.10	04/02/18 09:36	
Uranium-238, Dissolved	ug/L	ND	0.50	04/02/18 09:36	
Vanadium, Dissolved	ug/L	ND	1.0	04/02/18 09:36	

LABORATORY CONTROL SAMPLE & LCSD: 2875560

Parameter	Units	2875564								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Antimony, Dissolved	ug/L	100	104	104	104	104	85-115	0	20	
Arsenic, Dissolved	ug/L	100	105	104	105	104	85-115	1	20	
Beryllium, Dissolved	ug/L	100	110	109	110	109	85-115	1	20	
Boron, Dissolved	ug/L	100	106	110	106	110	85-115	4	20	
Cadmium, Dissolved	ug/L	100	106	105	106	105	85-115	1	20	
Chromium, Dissolved	ug/L	100	106	105	106	105	85-115	1	20	
Cobalt, Dissolved	ug/L	100	107	106	107	106	85-115	0	20	
Lead, Dissolved	ug/L	100	109	107	109	107	85-115	1	20	
Selenium, Dissolved	ug/L	100	107	106	107	106	85-115	1	20	
Thallium, Dissolved	ug/L	100	107	105	107	105	85-115	2	20	
Uranium-238, Dissolved	ug/L	100	111	111	111	111	85-115	0	20	
Vanadium, Dissolved	ug/L	100	103	104	103	104	85-115	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 531079 Analysis Method: EPA 524.2
 QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
 Associated Lab Samples: 10425264002

METHOD BLANK: 2883584 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/06/18 12:23	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/06/18 12:23	
4-Bromofluorobenzene (S)	%.	99	75-125	04/06/18 12:23	
Toluene-d8 (S)	%.	99	75-125	04/06/18 12:23	

LABORATORY CONTROL SAMPLE: 2883585

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	80.8	101	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2885151 2885152

Parameter	Units	10426572001		2885151		2885152		% Rec	% Rec	% Rec	Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	76.8	82.7	96	103	70-130	7	20		
1,2-Dichloroethane-d4 (S)	%.						101	99	75-125				
4-Bromofluorobenzene (S)	%.						101	99	75-125				
Toluene-d8 (S)	%.						99	98	75-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 437555 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10425264002

METHOD BLANK: 2375305 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/11/18 14:41	

LABORATORY CONTROL SAMPLE: 2375306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	ND	0	64-137	L2

LABORATORY CONTROL SAMPLE: 2375307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	22.1	246	50-150	L1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376829 2376830

Parameter	Units	35383245001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	<4.3	50	50	10.6	5.9J	21	12	64-137		30	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376831 2376833

Parameter	Units	35382684001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	9.8	6.6J	20	13	64-137		30	M0

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 437867 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10425264002

METHOD BLANK: 2376996 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/05/18 18:44	

LABORATORY CONTROL SAMPLE: 2376997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.6	78	70-130	

LABORATORY CONTROL SAMPLE: 2376998

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.58	145	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2377632 2377635

Parameter	Units	35382816003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diquat	ug/L	<0.30	2	2	1.9	1.8	93	90	70-130	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2377634 2377635

Parameter	Units	35382800001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diquat	ug/L	<0.30	2	2	1.9	1.9	95	95	70-130	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 437540 Analysis Method: EPA 552.3
 QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
 Associated Lab Samples: 10425264002

METHOD BLANK: 2375214 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
Dichloroacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/09/18 19:20	
Monobromoacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
Monochloroacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
Trichloroacetic Acid	ug/L	ND	1.0	04/09/18 19:20	
2,3-Dibromopropanoic Acid (S)	%	119	70-130	04/09/18 19:20	

LABORATORY CONTROL SAMPLE: 2375215

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	11.2	112	70-130	
Dichloroacetic Acid	ug/L	10	11.4	114	70-130	
Haloacetic Acids (Total)	ug/L	50	58.0	116	70-130	
Monobromoacetic Acid	ug/L	10	11.6	116	70-130	
Monochloroacetic Acid	ug/L	10	11.9	119	70-130	
Trichloroacetic Acid	ug/L	10	11.9	119	70-130	
2,3-Dibromopropanoic Acid (S)	%			125	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375474 2375475

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35382042001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	<0.43	10	10	12.1	11.9	121	119	70-130	2	30	
Dichloroacetic Acid	ug/L	<0.24	10	10	11.6	11.4	116	114	70-130	2	30	
Haloacetic Acids (Total)	ug/L	<0.67	50	50	58.5	57.8	117	116	70-130	1	30	
Monobromoacetic Acid	ug/L	<0.29	10	10	11.0	11.1	110	111	70-130	1	30	
Monochloroacetic Acid	ug/L	<0.90	10	10	11.4	11.1	114	111	70-130	2	30	
Trichloroacetic Acid	ug/L	<0.26	10	10	12.4	12.2	124	122	70-130	2	30	
2,3-Dibromopropanoic Acid (S)	%						121	124	70-130		30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376481 2376482

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35382993001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	4.1	10	10	15.5	15.5	114	113	70-130	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Parameter	Units	35382993001		2376481		2376482		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Dichloroacetic Acid	ug/L	16.4	10	10	27.2	27.3	108	109	70-130	0	30			
Haloacetic Acids (Total)	ug/L	28.9	50	50	101	103	145	149	70-130	2	30			
Monobromoacetic Acid	ug/L	0.29U	10	10	16.4	17.9	164	179	70-130	9	30	M1		
Monochloroacetic Acid	ug/L	0.90U	10	10	22.2	22.7	222	227	70-130	3	30	M1		
Trichloroacetic Acid	ug/L	8.3	10	10	20.1	20.0	118	117	70-130	1	30			
2,3-Dibromopropanoic Acid (S)	%						132	148	70-130		30	S0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 530540

Analysis Method: EPA 8011

QC Batch Method: EPA 8011

Analysis Description: GCS 8011 EDB DBCP

Associated Lab Samples: 10425264002

METHOD BLANK: 2879655

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/04/18 18:16	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/04/18 18:16	
4-Bromofluorobenzene (S)	%.	96	30-150	04/04/18 18:16	

LABORATORY CONTROL SAMPLE & LCSD: 2879656

2879657

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.11	0.11	98	100	60-140	2	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.11	98	98	60-140	1	20	
4-Bromofluorobenzene (S)	%.				101	105	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529686 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874942 Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/06/18 14:58	
4,4'-DDE	ug/L	ND	0.10	04/06/18 14:58	
4,4'-DDT	ug/L	ND	0.10	04/06/18 14:58	
Aldrin	ug/L	ND	0.050	04/06/18 14:58	
alpha-BHC	ug/L	ND	0.050	04/06/18 14:58	
alpha-Chlordane	ug/L	ND	0.050	04/06/18 14:58	
beta-BHC	ug/L	ND	0.050	04/06/18 14:58	
Chlordane (Technical)	ug/L	ND	0.50	04/06/18 14:58	
delta-BHC	ug/L	ND	0.050	04/06/18 14:58	
Dieldrin	ug/L	ND	0.10	04/06/18 14:58	
Endosulfan I	ug/L	ND	0.050	04/06/18 14:58	
Endosulfan II	ug/L	ND	0.10	04/06/18 14:58	
Endosulfan sulfate	ug/L	ND	0.10	04/06/18 14:58	
Endrin	ug/L	ND	0.10	04/06/18 14:58	
Endrin aldehyde	ug/L	ND	0.10	04/06/18 14:58	
Endrin ketone	ug/L	ND	0.10	04/06/18 14:58	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/06/18 14:58	
gamma-Chlordane	ug/L	ND	0.050	04/06/18 14:58	
Heptachlor	ug/L	ND	0.050	04/06/18 14:58	
Heptachlor epoxide	ug/L	ND	0.050	04/06/18 14:58	
Methoxychlor	ug/L	ND	0.50	04/06/18 14:58	
Toxaphene	ug/L	ND	1.5	04/06/18 14:58	
Decachlorobiphenyl (S)	%	77	30-143	04/06/18 14:58	
Tetrachloro-m-xylene (S)	%	83	62-125	04/06/18 14:58	

LABORATORY CONTROL SAMPLE & LCSD: 2874943

Parameter	Units	2874944							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	0.98	1.0	98	101	67-125	3	20		
4,4'-DDE	ug/L	1	0.94	0.97	94	97	68-125	3	20		
4,4'-DDT	ug/L	1	0.98	0.99	98	99	66-125	1	20		
Aldrin	ug/L	.5	0.38	0.41	76	83	46-125	8	20		
alpha-BHC	ug/L	.5	0.48	0.48	95	97	66-125	2	20		
alpha-Chlordane	ug/L	.5	0.46	0.47	92	94	72-125	2	20		
beta-BHC	ug/L	.5	0.46	0.47	93	94	72-125	1	20		
delta-BHC	ug/L	.5	0.47	0.48	95	96	37-141	1	20		
Dieldrin	ug/L	1	1.0	1.0	102	104	71-125	2	20		
Endosulfan I	ug/L	.5	0.44	0.45	88	89	69-125	2	20		
Endosulfan II	ug/L	1	1.0	1.0	100	101	73-125	1	20		
Endosulfan sulfate	ug/L	1	0.91	0.92	91	92	63-127	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Parameter	Units	2874943		2874944			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	0.94	0.96	94	96	72-125	2	20	
Endrin aldehyde	ug/L	1	0.94	0.96	94	96	70-125	1	20	
Endrin ketone	ug/L	1	1.0	1.0	102	104	72-127	1	20	
gamma-BHC (Lindane)	ug/L	.5	0.47	0.48	95	96	69-125	2	20	
gamma-Chlordane	ug/L	.5	0.41	0.42	81	83	64-125	3	20	
Heptachlor	ug/L	.5	0.42	0.45	85	90	54-125	6	20	
Heptachlor epoxide	ug/L	.5	0.46	0.47	93	94	72-125	2	20	
Methoxychlor	ug/L	5	4.8	4.9	96	99	67-127	2	20	
Decachlorobiphenyl (S)	%.				86	89	30-143			
Tetrachloro-m-xylene (S)	%.				89	91	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529687 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874946 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/03/18 11:04	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/03/18 11:04	
Decachlorobiphenyl (S)	%	84	30-125	04/03/18 11:04	
Tetrachloro-m-xylene (S)	%	66	30-125	04/03/18 11:04	

LABORATORY CONTROL SAMPLE & LCSD: 2874947

Parameter	Units	2874948								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.4	1.5	71	75	47-125	6	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.6	1.6	79	81	54-125	2	20	
Decachlorobiphenyl (S)	%				82	83	30-125			
Tetrachloro-m-xylene (S)	%				55	66	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529677 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874915 Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dichlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2,4-Dimethylphenol	ug/L	ND	50.0	04/03/18 17:31	
2,4-Dinitrophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Chlorophenol	ug/L	ND	10.0	04/03/18 17:31	
2-Methylnaphthalene	ug/L	ND	10.0	04/03/18 17:31	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/03/18 17:31	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/03/18 17:31	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/03/18 17:31	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/03/18 17:31	
Acenaphthene	ug/L	ND	10.0	04/03/18 17:31	
Anthracene	ug/L	ND	10.0	04/03/18 17:31	
Benzo(a)pyrene	ug/L	ND	10.0	04/03/18 17:31	
Benzoic acid	ug/L	ND	50.0	04/03/18 17:31	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/03/18 17:31	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/03/18 17:31	
Butylbenzylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-butylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Di-n-octylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Diethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Dimethylphthalate	ug/L	ND	10.0	04/03/18 17:31	
Fluoranthene	ug/L	ND	10.0	04/03/18 17:31	
Fluorene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorobenzene	ug/L	ND	10.0	04/03/18 17:31	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/03/18 17:31	
Hexachloroethane	ug/L	ND	10.0	04/03/18 17:31	
Isophorone	ug/L	ND	10.0	04/03/18 17:31	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/03/18 17:31	
Pentachlorophenol	ug/L	ND	20.0	04/03/18 17:31	
Phenanthrene	ug/L	ND	10.0	04/03/18 17:31	
Phenol	ug/L	ND	10.0	04/03/18 17:31	
Pyrene	ug/L	ND	10.0	04/03/18 17:31	
2,4,6-Tribromophenol (S)	%	81	65-125	04/03/18 17:31	
2-Fluorobiphenyl (S)	%	74	56-125	04/03/18 17:31	
2-Fluorophenol (S)	%	83	55-125	04/03/18 17:31	
Nitrobenzene-d5 (S)	%	81	60-125	04/03/18 17:31	
p-Terphenyl-d14 (S)	%	107	58-125	04/03/18 17:31	
Phenol-d6 (S)	%	87	58-125	04/03/18 17:31	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

LABORATORY CONTROL SAMPLE & LCSD: 2874916			2874917								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	41.4	42.1	83	84	74-125	2	20		
2,4-Dichlorophenol	ug/L	50	39.2	39.7	78	79	68-125	1	20		
2,4-Dimethylphenol	ug/L	50	28.9J	31J	58	62	33-125		20		
2,4-Dinitrophenol	ug/L	50	34.2	36.8	68	74	30-127	7	20		
2-Chlorophenol	ug/L	50	38.3	37.2	77	74	61-125	3	20		
2-Methylnaphthalene	ug/L	50	38.0	38.8	76	78	67-125	2	20		
2-Methylphenol(o-Cresol)	ug/L	50	36.4	35.0	73	70	63-125	4	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.3	36.8	75	74	67-125	1	20		
3,3'-Dichlorobenzidine	ug/L	50	45.7J	48.1J	91	96	60-125		20		
4-Bromophenylphenyl ether	ug/L	50	43.2	43.6	86	87	75-125	1	20		
Acenaphthene	ug/L	50	40.1	40.9	80	82	74-125	2	20		
Anthracene	ug/L	50	43.5	43.9	87	88	75-125	1	20		
Benzo(a)pyrene	ug/L	50	42.7	42.4	85	85	75-125	1	20		
Benzoic acid	ug/L	50	21.9J	22.1J	44	44	30-125		20	2M	
bis(2-Chloroethyl) ether	ug/L	50	35.4	34.0	71	68	55-125	4	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	41.0	41.6	82	83	72-129	1	20		
Butylbenzylphthalate	ug/L	50	41.2	41.2	82	82	69-127	0	20		
Di-n-butylphthalate	ug/L	50	41.5	42.0	83	84	75-125	1	20		
Di-n-octylphthalate	ug/L	50	41.6	41.4	83	83	69-131	1	20		
Diethylphthalate	ug/L	50	42.5	43.0	85	86	75-125	1	20		
Dimethylphthalate	ug/L	50	42.6	43.0	85	86	75-125	1	20		
Fluoranthene	ug/L	50	42.6	44.2	85	88	75-125	4	20		
Fluorene	ug/L	50	41.7	42.4	83	85	75-125	2	20		
Hexachlorobenzene	ug/L	50	42.0	42.3	84	85	74-125	1	20		
Hexachlorocyclopentadiene	ug/L	50	ND	ND	30	31	30-125		20		
Hexachloroethane	ug/L	50	28.9	26.6	58	53	30-125	9	20		
Isophorone	ug/L	50	37.8	38.4	76	77	72-125	2	20		
N-Nitrosodiphenylamine	ug/L	50	41.5	41.7	83	83	75-125	0	20		
Pentachlorophenol	ug/L	50	35.5	36.9	71	74	52-125	4	20		
Phenanthrene	ug/L	50	43.3	43.5	87	87	75-125	1	20		
Phenol	ug/L	50	38.0	36.7	76	73	59-125	3	20		
Pyrene	ug/L	50	44.1	44.3	88	89	75-125	0	20		
2,4,6-Tribromophenol (S)	%				90	92	65-125				
2-Fluorobiphenyl (S)	%				80	82	56-125				
2-Fluorophenol (S)	%				80	77	55-125				
Nitrobenzene-d5 (S)	%				76	77	60-125				
p-Terphenyl-d14 (S)	%				99	101	58-125				
Phenol-d6 (S)	%				82	81	58-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 19135	Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A	Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10425264002	

METHOD BLANK: 76173 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	03/30/18 17:07	

LABORATORY CONTROL SAMPLE: 76174

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	496	124	44-176	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529611 Analysis Method: Hach 10360 Rev 1.1
QC Batch Method: Hach 10360 Analysis Description: Hach 10360 Rev 1.1, BOD
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874632 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/03/18 10:09	B4,B6

LABORATORY CONTROL SAMPLE: 2874634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	230	116	85-115	B4,B6

SAMPLE DUPLICATE: 2874635

Parameter	Units	10425153001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	646	638	1	20	B4,B6

SAMPLE DUPLICATE: 2875024

Parameter	Units	10425370001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	4390	3740	16	20	B4,B6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 530982 Analysis Method: EPA 1664A OG
 QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
 Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2883199 Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/06/18 09:14	

LABORATORY CONTROL SAMPLE: 2883200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	31.8	80	78-114	

MATRIX SPIKE SAMPLE: 2883202

Parameter	Units	10425716001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	44	35.1	77	78-114	M1

SAMPLE DUPLICATE: 2883201

Parameter	Units	10425987001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	57.0	60.4	6	18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529722

Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1

Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875161

Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	03/29/18 15:26	

LABORATORY CONTROL SAMPLE: 2875162

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.3	101	90-110	

SAMPLE DUPLICATE: 2875163

Parameter	Units	10425264002 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	416	406	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 530305 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2878449 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/03/18 16:10	

LABORATORY CONTROL SAMPLE: 2878450

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	90.0	90	80-120	

SAMPLE DUPLICATE: 2878452

Parameter	Units	10425301001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	84.0	80.0	5	10	

SAMPLE DUPLICATE: 2878909

Parameter	Units	10425211001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch:	438356	Analysis Method:	SM 4500-CIO2
QC Batch Method:	SM 4500-CIO2	Analysis Description:	4500CIO2 Chlorine Dioxide
Associated Lab Samples:	10425264002		

METHOD BLANK: 2380118 Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/06/18 13:42	H6

LABORATORY CONTROL SAMPLE: 2380119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	94	90-110	H6

SAMPLE DUPLICATE: 2380120

Parameter	Units	10424606001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.25	0.25	0	20	H6

SAMPLE DUPLICATE: 2380121

Parameter	Units	7584977001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.95	0.96	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 529922 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10425264001, 10425264002

LABORATORY CONTROL SAMPLE: 2876210

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	100	98-102	H6

SAMPLE DUPLICATE: 2876211

Parameter	Units	10425038001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.6	1	3	H6

SAMPLE DUPLICATE: 2876212

Parameter	Units	10425367003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.1	1	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529627 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874679 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	03/30/18 20:53	
Fluoride	mg/L	ND	0.050	03/30/18 20:53	

LABORATORY CONTROL SAMPLE: 2874680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.6	93	90-110	
Fluoride	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874681 2874682

Parameter	Units	10424547001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	8.6	12.5	12.5	19.8	19.8	89	90	90-110	0	20	M1
Fluoride	mg/L	0.29	1	1	1.3	1.3	98	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874683 2874684

Parameter	Units	10424924002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	156	62.5	62.5	207	207	81	81	90-110	0	20	M1
Fluoride	mg/L	0.065	1	1	1.1	1.1	103	104	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch:	437078	Analysis Method:	EPA 300.1
QC Batch Method:	EPA 300.1	Analysis Description:	300.1 Oxihalides IC Anions
Associated Lab Samples:	10425264002		

METHOD BLANK: 2373461 Matrix: Water
Associated Lab Samples: 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/01/18 11:32	

LABORATORY CONTROL SAMPLE: 2373462

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	37.5	94	85-115	

MATRIX SPIKE SAMPLE: 2373464

Parameter	Units	35382915001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	638U	20000	18500	93	75-125	

SAMPLE DUPLICATE: 2373463

Parameter	Units	35382915001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	638U	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529585 Analysis Method: SM 3500-Cr D Modified
QC Batch Method: SM 3500-Cr D Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2874562 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/29/18 09:06	FS

LABORATORY CONTROL SAMPLE: 2874563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2874564 2874565

Parameter	Units	10425264002		2874564		2874565		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Chromium, Hexavalent	mg/L	ND	.2	.2	.0034J	.0042J	0	0	85-115	20	FS,M3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 139871

Analysis Method: EPA 350.1 rev. 2 (1993)

QC Batch Method: EPA 350.1 rev. 2 (1993)

Analysis Description: 350.1 Ammonia Distilled

Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 553942

Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/06/18 09:50	

LABORATORY CONTROL SAMPLE: 553943

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	10.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 553944 553945

Parameter	Units	553944		553945		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.								
Nitrogen, Ammonia	mg/L	32.8	10	39.0	10	62	56	90-110	2	10	M1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 529706 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2875009 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	03/29/18 14:18	FS
Nitrite as N	mg/L	ND	0.020	03/29/18 14:18	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	03/29/18 14:18	FS

LABORATORY CONTROL SAMPLE: 2875010

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.98	98	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.95	95	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2875011 2875012

Parameter	Units	10425264002		2875011		2875012		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Nitrite as N	mg/L	ND	1	1	0.99	0.97	99	97	90-110	2	20 FS
Nitrogen, NO2 plus NO3	mg/L	0.021	1	1	0.94	0.95	92	93	90-110	2	20 FS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 19623

Analysis Method: EPA 9016

QC Batch Method: EPA 9016

Analysis Description: 9016 Free Cyanide

Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 77969

Matrix: Water

Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/05/18 17:03	

LABORATORY CONTROL SAMPLE: 77970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	151	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77971

77972

Parameter	Units	10424606001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Cyanide, Free	ug/L	ND	150	150	160	160	106	106	80-120	0	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 530296 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2878424 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/03/18 12:40	

LABORATORY CONTROL SAMPLE: 2878425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	241	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878426 2878427

Parameter	Units	10423797004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	1.5 mg/L	250	250	1950	1840	172	128	80-120	6	30	H3,M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878428 2878429

Parameter	Units	10425152001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	38.4	250	250	269	268	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

QC Batch: 530990 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10425264001, 10425264002

METHOD BLANK: 2883227 Matrix: Water
Associated Lab Samples: 10425264001, 10425264002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/06/18 13:06	

LABORATORY CONTROL SAMPLE: 2883228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2883229 2883230

Parameter	Units	10425457001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	ND	1	1	0.99	1.0	97	102	80-120	5	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2883231 2883232

Parameter	Units	10425982002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.53	1	1	1.5	1.6	101	111	80-120	7	30	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Sample: FD-SB-B3 **Lab ID: 10425264002** Collected: 03/28/18 13:00 Received: 03/28/18 15:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	5.96 ± 2.57 (2.98) C:NA T:NA	pCi/L	04/05/18 09:17	12587-46-1	
Gross Beta	EPA 900.0	98.4 ± 18.0 (2.66) C:NA T:NA	pCi/L	04/05/18 09:17	12587-47-2	
Radium-226	EPA 903.1	0.486 ± 0.413 (0.581) C:NA T:93%	pCi/L	04/12/18 21:18	13982-63-3	
Radium-228	EPA 904.0	0.462 ± 0.345 (0.667) C:72% T:75%	pCi/L	04/10/18 13:24	15262-20-1	
Total Radium	Total Radium Calculation	0.948 ± 0.758 (1.25)	pCi/L	04/19/18 11:02	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 293307

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10425264002

METHOD BLANK: 1435471

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.025 ± 0.367 (1.14) C:NA T:NA	pCi/L	04/05/18 08:54	
Gross Beta	0.724 ± 0.848 (1.83) C:NA T:NA	pCi/L	04/05/18 08:54	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 293327

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10425264002

METHOD BLANK: 1435510

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.436 ± 0.363 (0.727) C:77% T:72%	pCi/L	04/10/18 13:21	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

QC Batch: 293258

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10425264002

METHOD BLANK: 1435309

Matrix: Water

Associated Lab Samples: 10425264002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.262 ± 0.310 (0.487) C:NA T:92%	pCi/L	04/12/18 20:30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-O Pace Analytical Services - Ormond Beach
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10425264
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 19214
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

BATCH QUALIFIERS

Batch: 529937

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 529951

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530304

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530440

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530842

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530982

[BE] Batch extracted by solid phase extraction (SPE).

ANALYTE QUALIFIERS

- 1M Sample pH adjusted using 6mL 6N HCl.
- 2M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- B2 Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
- B4 The glucose/glutamic acid standard exceeded the range of 198 plus or minus 30.5 mg/L.
- B6 The calculated seed correction exceeded the range of 0.6 to 1.0 mg/L.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- FS The sample was filtered in the laboratory prior to analysis.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- S0 Surrogate recovery outside laboratory control limits.
- S3 Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10425264

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425264002	FD-SB-B3	EPA 531.1	436885		
10425264002	FD-SB-B3	EPA 547	437576		
10425264002	FD-SB-B3	EPA 549.2	437867	EPA 549.2	438016
10425264002	FD-SB-B3	EPA 552.3	437540	EPA 552.3	437945
10425264002	FD-SB-B3	EPA 8011	530540	EPA 8011	530842
10425264002	FD-SB-B3	EPA 8015 Alcohol-Glycol	435508		
10425264002	FD-SB-B3	EPA 8015 Alcohol-Glycol	435082		
10425264001	Field Blank	EPA Mod. 3510C	529686	EPA 8081B	530443
10425264002	FD-SB-B3	EPA Mod. 3510C	529686	EPA 8081B	530443
10425264001	Field Blank	EPA Mod. 3510C	529687	EPA 8082A	530304
10425264002	FD-SB-B3	EPA Mod. 3510C	529687	EPA 8082A	530304
10425264002	FD-SB-B3	EPA 8315A	19135	EPA 8315A	19214
10425264002	FD-SB-B3	EPA 8316	19422		
10425264001	Field Blank	EPA 200.7	529771	EPA 200.7	529951
10425264002	FD-SB-B3	EPA 200.7	529771	EPA 200.7	529951
10425264001	Field Blank	EPA 200.8	529767	EPA 200.8	529968
10425264002	FD-SB-B3	EPA 200.8	529767	EPA 200.8	529968
10425264001	Field Blank	EPA 200.8	529770	EPA 200.8	529937
10425264002	FD-SB-B3	EPA 200.8	529770	EPA 200.8	529937
10425264001	Field Blank	EPA 245.1	529772	EPA 245.1	530149
10425264002	FD-SB-B3	EPA 245.1	529772	EPA 245.1	530149
10425264002	FD-SB-B3	EPA 548.1	437555	EPA 548.1	438087
10425264001	Field Blank	EPA 3520	529677	EPA 8270D	530440
10425264002	FD-SB-B3	EPA 3520	529677	EPA 8270D	530440
10425264002	FD-SB-B3	EPA 524.2	531079		
10425264002	FD-SB-B3				
10425264002	FD-SB-B3	EPA 900.0	293307		
10425264002	FD-SB-B3	EPA 903.1	293258		
10425264002	FD-SB-B3	EPA 904.0	293327		
10425264002	FD-SB-B3	Total Radium Calculation	295020		
10425264001	Field Blank	Hach 10360	529611	Hach 10360 Rev 1.1	529900
10425264002	FD-SB-B3	Hach 10360	529611	Hach 10360 Rev 1.1	529900
10425264001	Field Blank	EPA 1664A OG	530982		
10425264002	FD-SB-B3	EPA 1664A OG	530982		
10425264001	Field Blank	EPA 180.1	529722		
10425264002	FD-SB-B3	EPA 180.1	529722		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10425264

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425264001	Field Blank	SM 2540D	530305		
10425264002	FD-SB-B3	SM 2540D	530305		
10425264002	FD-SB-B3	SM 4500-CIO2	438356		
10425264001	Field Blank	SM 4500-H+B	529922		
10425264002	FD-SB-B3	SM 4500-H+B	529922		
10425264001	Field Blank	Trivalent Chromium Calculation	530596		
10425264002	FD-SB-B3	Trivalent Chromium Calculation	530596		
10425264001	Field Blank	EPA 300.0	529627		
10425264002	FD-SB-B3	EPA 300.0	529627		
10425264002	FD-SB-B3	EPA 300.1	437078		
10425264002	FD-SB-B3	EPA 300.1	437079		
10425264001	Field Blank	SM 3500-Cr D Modified	529585		
10425264002	FD-SB-B3	SM 3500-Cr D Modified	529585		
10425264002	FD-SB-B3	EPA 350.1			
10425264001	Field Blank	EPA 350.1 rev. 2 (1993)	139871	EPA 350.1 rev. 2 (1993)	140053
10425264002	FD-SB-B3	EPA 350.1 rev. 2 (1993)	139871	EPA 350.1 rev. 2 (1993)	140053
10425264001	Field Blank	EPA 353.2	529706		
10425264002	FD-SB-B3	EPA 353.2	529706		
10425264001	Field Blank	EPA 9016	19623	EPA 9016	19643
10425264002	FD-SB-B3	EPA 9016	19623	EPA 9016	19643
10425264001	Field Blank	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10425264002	FD-SB-B3	SM 4500-CN-E	530296	SM 4500-CN-E	530376
10425264001	Field Blank	SM 4500-P B	530990	SM 4500-P E	531088
10425264002	FD-SB-B3	SM 4500-P B	530990	SM 4500-P E	531088

REPORT OF LABORATORY ANALYSIS

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WO#: 10425264



Chain-of-Custody Form

Work Order Number:

Turnaround Time:

Page: 1 of

PROJECT/CLIENT INFO

Facility Code: MPCA Freeway LF Waters Program Code (MDH Lab Only):
 Project Name: MPCA Freeway LF Waters Project Task Code:
 Project Manager:
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name:
 Address: 18-00383
Epic Profile #38716
 Phone No:

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample-Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wtr-Ground=Groundwater
 Wtr-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS		Lab Sample No.	#
												ANALYSIS	PRESERV.		
Field Blank	QC-FB	3/28/18	1000			G		QC-Blank			15	X	LIST A	001	1
F.D-SB-B3	S	3/28/18	1300			G		Wtr-Ground			41	X	LIST A, B, C	002	2
															3
															4
															5
															6
															7
															8
															9
															10

DATA 3/28/18

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <u>David Anderson / Proce Analytical</u>	<u>3/28/18/1525</u>	<u>UW Proce 3-28-18</u>	<u>1525</u>

11.0 °C
 17.2 °C
 11.5 °C

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/15 email from Mark Umholtz (MPCA).
 BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (THMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0


Sample Condition Upon Receipt Client Name: MPCA - Field Project #: WO#: 10425264
 Courier: Fed Ex UPS USPS Client MD 3/28/18
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer 151401163 Used: G87A9155100842 Type of Ice: Wet Blue None Dry Melted
 Cooler Temp Read (°C): 10.8, 12.0, 11.3 Cooler Temp Corrected (°C): 11.0, 12.2, 11.5 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: MD 3/28/18
 USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample #1: <u>3/2 1-2: 1/1</u> <u>1/1</u> sample 002 2: <u>5/5</u> PH = 11.0
Exception: <u>VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: <u>MD</u> Lot # of added preservative: <u>1117041</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: BA VC Date: 3/29/18
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

	Document Name: Sample Condition Upon Receipt Form	Document Revised: 14Dec2017 Page 2 of 2
	Document No.: F-MN-L-213-rev.22	Issuing Authority: Pace Minnesota Quality Office

SCUR Exceptions:

Workorder #:

Issue	Sample ID	Container Type/#

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials
FD-SB-B3	HNO3	4.0	3/29/18	1616	2.0 mL	1117041	1.0	MD
FD-SB-B3	"	4.0	"	"	"	"	1.0	MD
FD-SB-B3	"	6.0	"	"	"	"	1.0	MD
FD-SB-B3	"	6.0	"	"	1.0 mL	"	1.0	MD
FD-SB-B3	"	6.0	"	"	"	"	1.0	MD

Note: 2 mL HNO3 added to BP1N containers, 1 mL HNO3 added to BP3N containers

Chain of Custody

WO#: 12106520



12106520

Page 64 of 87

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To		Subcontract To					Requested Analysis																																							
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">Nitrogen, unionized ammonia, as N</div> <table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr> <th colspan="10">Preserved Containers</th> </tr> <tr> <th>H2SO4</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table> </div>										Preserved Containers										H2SO4																			
Preserved Containers																																														
H2SO4																																														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4																																								
1	Field Blank	PS	3/28/2018 10:00	10425264001	Water	1																																								
2	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	1																																								
3																																														
4																																														
5																																														

Transfers						Comments									
Released By	Date/Time	Received By	Date/Time												
<i>[Signature]</i>	3/29/18 17:40	<i>[Signature]</i>	3-29-18 18:15												
<i>[Signature]</i>	3-29-18 22:30	<i>[Signature]</i>	3/30/18 06:15												

Cooler Temperature on Receipt	1.0 °C	Custody Seal	Y or N	Received on Ice	Y or N	Samples Intact	Y or N
-------------------------------	--------	--------------	--------	-----------------	--------	----------------	--------

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: MPCA PAST-MNFLD

Project #:

WO#: 12106520
 PM: HRZ Due Date: 04/11/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.7 Cooler Temp Corrected °C: 1.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 40.3 Date and Initials of Person Examining Contents: 3-29-18 DC

Comments: Bm 3/30/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WTF</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Angela R Date: 3/30/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody Return to Sender

WO# : 12106520

 12106520

Samples were sent directly to the Subcontracting Laboratory.


State Of Origin: MN

Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To: **Bob Michels** Subcontract To: **Pace Analytical Virginia MN** Requested Analysis:

Bob Michels
 Pace Analytical Minnesota
 1700 Elm Street
 Suite 200
 Minneapolis, MN 55414
 Phone (612)607-6452

Pace Analytical Virginia MN
 315 Chestnut Street
 Virginia, MN 55792
 Phone (218)742-1042

WO# : 10425264

 10425264

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Nitrogen, unionized ammonia, as N	LAB USE ONLY
						H2SO4					
1	Field Blank	PS	3/28/2018 10:00	10425264001	Water	1				X	
2	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	1				X	
3											
4											
5											

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/29/18 17:40	DJ Crisp	3-29-18 18:15	
2	<i>[Signature]</i>	3-29-18 22:30	B. Mathers	3/30/18 06:15	
3			<i>[Signature]</i>	4/3/18 15:30	

Cooler Temperature on Receipt 1.0 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Relinquished: *[Signature]* 4/4/18 18:35

[Signature] 4/4/18 4/4/18 18:35
 T= 2:1



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
F-MN-L-213-rev.22

Document Revised: 14Dec2017
 Page 1 of 2
 Issuing Authority:
 Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN

Project #:

WO#: 10425264

PM: BM2 Due Date: 04/11/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842
 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 1.9 Cooler Temp Corrected (°C): 2.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 4/4/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1. <u>Return Sample</u>
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2</u> <u>1/1</u>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review:

Date: _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

WO# : 4610126

Chain of Custody

Samples were sent



4610126

State Of Origin: MN



Workorder: 10425264

Workorder Name: 18-00383 MPCA Freeway LF Water

Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To		Subcontract To				Requested Analysis																									
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Grand Rapids 5560 Corporate Exchange Court Grand Rapids, MI 49512 USA Phone (616)975-4500																													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Acrylamide EPA 8316 PDFW	Formaldehyde EPA 8315 PGRM	Free Cyanide by SM4500CIG	LAB USE ONLY																		
						Other	Unpreserved																								
1	Field Blank	PS	3/28/2018 10:00	10425264001	Water	3																									21-4
2	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	3	4					X	X	X																	L9
3																															L8
4																															
5																															

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>my hus pace</i>	<i>3/29/18 1715</i>	<i>RTM</i>	<i>3/30/18 0920</i>	
2					
3					

Cooler Temperature on Receipt ____ °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client <u>Pace Minnesota</u>	Work Order # <u>4610126</u>
Receipt Record Page/Line # <u>21-4</u>	Project Chemist _____ Sample #s _____

Recorded by (initials/date) <u>PS 3/30/18</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other _____	Qty Received <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) Thermometer Used <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> See Additional Cooler Information Form <input type="checkbox"/> Other (# _____)
--	--	--------------------------	--

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time
<u>Blue</u>	<u>0942</u>						
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact	
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None	
Coolant Location: <input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom	
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
	Observed °C	Correction Factor °C	Actual °C		Observed °C	Correction Factor °C	Actual °C
Temp Blank:				Temp Blank:			
Sample 1:	<u>2.7</u>	<u> </u>	<u>2.7</u>	Sample 1:			
Sample 2:	<u>2.4</u>	<u> </u>	<u>2.4</u>	Sample 2:			
Sample 3:	<u>2.8</u>	<u> </u>	<u>2.8</u>	Sample 3:			
3 Sample Average °C: _____				3 Sample Average °C: _____			
<input type="checkbox"/> Cooler ID on COC?				<input type="checkbox"/> Cooler ID on COC?			
<input type="checkbox"/> VOC Trip Blank received?				<input type="checkbox"/> VOC Trip Blank received?			

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Chain of Custody record(s)? If No, Initiated By _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Received for Lab Signed/Date/Time?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Shipping document?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other _____

Check Sample Preservation

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Blank OR average sample temperature, ≥6° C?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If either is ≥6° C, was thermal preservation required? If "Yes", Project Chemist Approval Initials: _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes" Completed Non Con Cooler - Cont Inventory Form?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Completed Sample Preservation Verification Form?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Samples chemically preserved correctly? If "No", added orange tag?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Received pre-preserved VOC soils? <input type="checkbox"/> MeOH <input type="checkbox"/> Na ₂ SO ₄

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Analysis Requested?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID matches COC?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample Date and Time matches COC?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Container type completed on COC?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	All container types indicated are received?

Check for Short Hold-Time Prep/Analyses

<input type="checkbox"/>	Bacteriological
<input type="checkbox"/>	Air Bags
<input type="checkbox"/>	EnCores / Methanol Pre-Preserved
<input checked="" type="checkbox"/>	Formaldehyde/Aldehyde
<input type="checkbox"/>	Green-tagged containers
<input type="checkbox"/>	Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)

NONE RECEIVED
 RECEIVED, COCs TO LAB(S)

Sample Condition Summary

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Broken containers/lids?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Missing or incomplete labels?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Illegible information on labels?
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Low volume received?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Inappropriate or non-Pace containers received?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	VOC vials / TOX containers have headspace?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Extra sample locations / containers not listed on COC?

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
<u>PS 3/30/18</u>	<u>PS 3/30/18</u>	<u>Yes / No</u>

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client <u>Pace Minnesota</u>	Work Order # <u>4610126</u>
Receipt Log # <u>21-4</u>	Completed By (initials/date) <u>JS 8/30/18</u>
Project Manager _____	

COC ID # _____												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓												
COC Line #2	✓, 10												
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID # _____												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1													
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____



SAMPLE RECEIVING NON-CONFORMANCE REPORT

Client <i>Pace Minnesota</i>		Work Order # <i>4610126</i>	
Receipt Log # <i>21-4</i>	Completed By (initials/date) <i>TS 3/30/18</i>	Project Chemist	

List non-conformance issues associated with this work order in the chart below/left. Identify discrepancies between the COC and sample tags in the chart below/right. Add comments as needed.

COC ID #	Line #	Type of Problem											COC					Sample Tag					Line Item Comments
		Discrepancy	Missing Container	Broken Container	Label Missing / Incomplete	Label Illegible	Low Volume	Inappropriate Container	Headspace	Not Listed on COC	Preservation	Sample Field ID	Date Sampled	Time Sampled	Container Type	Qty	Sample Field ID	Date Sampled	Time Sampled	Container Type	Qty		
	<i>2</i>																						<i>See pH form</i>

General Comments:

Project Chemist (initials/date)

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN



Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Subcontract To Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600		Requested Analysis											
---	--	--	--	--------------------	--	--	--	--	--	--	--	--	--	--	--

WO# : 30247798

30247798

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY
						HNO3								
1	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	3				X	X	X	X	001
2														
3														
4														
5														

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	3/29/18 1700	<i>[Signature]</i>	3/30/18 0950	
2					
3					

Cooler Temperature on Receipt W/A°C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace Mn

Project # 30247798

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 747598318618

Label	<u>74</u>
LIMS Login	<u>71</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D1071</u>	<u>74 3/30/18</u>
Chain of Custody Present:	/			1.	
Chain of Custody Filled Out:	/			2.	
Chain of Custody Relinquished:	/			3.	
Sampler Name & Signature on COC:		/		4.	
Sample Labels match COC:	/			5.	
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	/			6.	
Short Hold Time Analysis (<72hr remaining):		/		7.	
Rush Turn Around Time Requested:		/		8.	
Sufficient Volume:	/			9.	
Correct Containers Used:	/			10.	
-Pace Containers Used:	/				
Containers Intact:	/			11.	
Orthophosphate field filtered			/	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.	
Organic Samples checked for dechlorination:			/	14.	
Filtered volume received for Dissolved tests			/	15.	
All containers have been checked for preservation.	/			16.	<u>Pitzer</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/				
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>74</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/	17.	
Trip Blank Present:			/	18.	
Trip Blank Custody Seals Present			/		
Rad Aqueous Samples Screened > 0.5 mrem/hr		/		Initial when completed: <u>74</u>	Date: <u>3/30/18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To		Subcontract To				Requested Analysis														
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100																		
						Methyl alcohol/Ethylene glycol EPA														
						LAB USE ONLY														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers														
1	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	1														
2																				
3																				
4																				
5																				
Transfers																		Comments		
Released By	Date/Time	Received By	Date/Time																	
1	3/29/18	1735	FED EX																	
2	FED EX		3/30/18 0810																	
3																				
Cooler Temperature on Receipt 0.7 °C		Custody Seal (Y) or N				Received on Ice (Y) or N				Samples Intact (Y) or N										

50193384

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 5019 3384 **Date/Time and Initials of person examining contents:** 3/30/18 1442 DJ

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 8662

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 123456ABCDEF **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 0.5/0.7 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.			All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl. All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)						
Chain of Custody Present:			Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:			Dissolved Metals field filtered?:			
Short Hold Time Analysis (<72hr)?: Analysis:			Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608) Residual Chlorine Check (Total/Amenable/Free Cyanide)	Present	Absent	N/A
Rush TAT Requested:			Headspace in VOA Vials (>6mm):			
Containers Intact?:			Trip Blank Present?:			
Sample Labels Match COC?: Except TCs, which only require sample ID			Trip Blank Custody Seals?:			

Comments:

Sample Container Count

WO#: 50193384



50193384

CLIENT: Pace MW
 COC PAGE 1 of 1
 COC ID# _____

Project # 50193384

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit	Matrix (Soil/Water/Aqueous)	pH <2	pH >9	pH >12	
																		R					
1																		R	DG9U				
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VG9AU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
VG9FU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
VG9FU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

NO#: 35382986



35382986

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To		Subcontract To				Requested Analysis											
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Aldicarb/Carbofuran EPA 8318	Bromate/Chlorite by EPA 300.1	Chlorine Dioxide SM4500ClO2	Diquat EPA 549.2	Endothall EPA 548.1	Glyphosate EPA 547	Haloacetic acids, total (HAAS) EPA	LAB USE ONLY
						Other	Unpreserved	NA2S2O3									
1	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	3	1	2		X	X	X	X	X	X	X	
2																	
3																	
4																	
5																	

Transfers					Comments
Released By	Date/Time	Received By	Date/Time		
<i>Long Vu</i> PACE	3/29/18 16:55	<i>M. D. A. PACE</i>	3/29/18 10:30		

Cooler Temperature on Receipt 4.7 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

NO# : 35382986
PM: ADC Due Date: 04/13/18
CLIENT: PACMIN

Project #
Project Manager:
Client:

Date and Initials of person:
Examining contents: _____
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T336 Date: 3/30/18 Time: 1030 Initials: JLC

State of Origin: _____

Cooler #1 Temp. °C 5.1 (Visual) 0.4 (Correction Factor) 4.7 (Actual) Samples on ice, cooling process has begun
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7473 9831 8607

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservative: Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Chain of Custody

A181320



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425264 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 3/28/2018 Results Requested By: 4/11/2018

Report To		Subcontract To					Requested Analysis																						
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700					<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Herbicides MDA List II EPA 8151</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Pesticides MDA List I (8270 Pest)</div> </div>																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Unpreserved	<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Herbicides MDA List II EPA 8151</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Pesticides MDA List I (8270 Pest)</div> </div>												LAB USE ONLY					
1	FD-SB-B3	PS	3/28/2018 13:00	10425264002	Water	2						X	X															01	
2																													
3																													
4																													
5																													
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																							
1		<i>[Signature]</i>	3/29/18 17:00	<i>[Signature]</i>	3/30/18 10:13																								
2																													
3																													
Cooler Temperature on Receipt		3 °C	Custody Seal <input checked="" type="radio"/> Y or N		Received on Ice <input checked="" type="radio"/> Y or N		Samples Intact <input checked="" type="radio"/> Y or N																						

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 7/12/18



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 11, 2018

Bob Michels
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/30/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425264
Project Manager: Bob Michels

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-SB-B3 (10425264002)	A181320-01	Water	03/28/2018	03/30/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 03/30/2018. Sample was received at 1.3 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LCS recovery indicates a potential high bias for 2,4,5-TP, 2,4-D, 2,4-DB, bentazon, dicamba, MCPA and triclopyr for sample A181320-01. Sample was less than the reporting limit for these analytes so no further action is required.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425264
 Project Manager: Bob Michels

FD-SB-B3 (10425264002)

Date Sampled
03/28/2018 13:00

A181320-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804106

Acetochlor	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/03/2018	04/06/2018 10:51	EPA 8270D	

Surrogate: Atrazine-d5		88.5 %		65.1-122	04/03/2018	04/06/2018 10:51	EPA 8270D	
Surrogate: Parathion-d10		89.4 %		22.3-159	04/03/2018	04/06/2018 10:51	EPA 8270D	
Surrogate: Triphenyl phosphate		185 %		65.2-151	04/03/2018	04/06/2018 10:51	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804111

2,4-D	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/04/2018	04/07/2018 05:57	EPA 8151A	

Surrogate: 2,4-D-d5		102 %		44.2-121	04/04/2018	04/07/2018 05:57	EPA 8151A	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425264
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804106 - EPA 3510C

Blank (A804106-BLK1)

Prepared: 04/03/2018 Analyzed: 04/06/2018 02:45

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.9</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>76.5</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.526</i>		<i>ug/L</i>	<i>0.5000</i>		<i>105</i>	<i>65.2-151</i>			

LCS (A804106-BS1)

Prepared: 04/03/2018 Analyzed: 04/06/2018 01:14

Acetochlor	0.820	0.50	ug/L	1.000		82.0	67.5-120			
Alachlor	0.941	0.50	ug/L	1.000		94.1	71.7-120			
Atrazine	0.885	0.50	ug/L	1.000		88.5	72.8-113			
Chlorpyrifos	0.874	0.50	ug/L	1.000		87.4	65.3-119			
Cyanazine	0.935	0.20	ug/L	1.000		93.5	49.5-140			
Desethylatrazine	0.845	0.50	ug/L	1.000		84.5	66.9-116			
Deisopropylatrazine	0.800	0.50	ug/L	1.000		80.0	44.3-110			
Dimethenamid	0.897	0.50	ug/L	1.000		89.7	63.8-116			
EPTC	0.715	0.50	ug/L	1.000		71.5	41.7-102			
Ethalfuralin	0.593	0.50	ug/L	1.000		59.3	41-127			
Fonofos	0.860	0.50	ug/L	1.000		86.0	59.7-118			
Metolachlor	0.968	0.50	ug/L	1.000		96.8	71.7-122			
Metribuzin	0.897	0.50	ug/L	1.000		89.7	66.6-128			
Pendimethalin	0.889	0.50	ug/L	1.000		88.9	55.5-137			
Phorate	0.599	0.30	ug/L	1.000		59.9	41.2-114			
Prometon	0.924	0.50	ug/L	1.000		92.4	66.3-120			
Propachlor	0.863	0.50	ug/L	1.000		86.3	65.8-119			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425264
Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804106 - EPA 3510C

LCS (A804106-BS1)

Prepared: 04/03/2018 Analyzed: 04/06/2018 01:14

Propazine	0.861	0.50	ug/L	1.000		86.1	72-122			
Simazine	0.919	0.50	ug/L	1.000		91.9	72.8-113			
Terbufos	0.607	0.20	ug/L	1.000		60.7	38.6-115			
Triallate	0.842	0.50	ug/L	1.000		84.2	51.4-116			
Trifluralin	0.660	0.50	ug/L	1.000		66.0	46.1-134			
Surrogate: Atrazine-d5	0.421		ug/L	0.5000		84.2	65.1-122			
Surrogate: Parathion-d10	0.481		ug/L	0.5000		96.2	22.3-159			
Surrogate: Triphenyl phosphate	0.504		ug/L	0.5000		101	65.2-151			

Matrix Spike (A804106-MS1)

Source: A181314-05

Prepared: 04/03/2018 Analyzed: 04/06/2018 01:44

Acetochlor	1.00	0.50	ug/L	1.020	ND	98.4	67.3-128			
Alachlor	1.11	0.50	ug/L	1.020	ND	109	58.2-150			
Atrazine	1.66	0.50	ug/L	1.020	0.768	87.7	70.1-120			
Chlorpyrifos	1.04	0.50	ug/L	1.020	ND	102	73.3-118			
Cyanazine	1.12	0.20	ug/L	1.020	ND	110	60.6-140			
Desethylatrazine	1.29	0.50	ug/L	1.020	0.332	94.3	69.7-122			
Deisopropylatrazine	1.03	0.50	ug/L	1.020	0.204	80.5	48-121			
Dimethenamid	1.10	0.50	ug/L	1.020	ND	108	63.7-123			
EPTC	0.984	0.50	ug/L	1.020	ND	96.4	58-109			
Ethalfluralin	1.01	0.50	ug/L	1.020	ND	98.7	59.3-129			
Fonofos	1.03	0.50	ug/L	1.020	ND	101	73.5-108			
Metolachlor	22.0	5.0	ug/L	1.020	19.5	250	40.9-156			M1, D
Metribuzin	1.05	0.50	ug/L	1.020	ND	103	70.9-136			
Pendimethalin	1.18	0.50	ug/L	1.020	ND	115	55.4-155			
Phorate	0.711	0.30	ug/L	1.020	ND	69.7	60.2-108			
Prometon	1.03	0.50	ug/L	1.020	ND	101	74.7-124			
Propachlor	1.05	0.50	ug/L	1.020	ND	103	72.3-115			
Propazine	0.996	0.50	ug/L	1.020	ND	97.7	73.7-124			
Simazine	1.03	0.50	ug/L	1.020	0.0619	95.2	74.8-114			
Terbufos	0.786	0.20	ug/L	1.020	ND	77.1	56.1-114			
Triallate	1.06	0.50	ug/L	1.020	ND	104	65.5-107			
Trifluralin	0.896	0.50	ug/L	1.020	ND	87.9	58-149			
Surrogate: Atrazine-d5	0.509		ug/L	0.5102		99.9	65.1-122			
Surrogate: Parathion-d10	0.607		ug/L	0.5102		119	22.3-159			
Surrogate: Triphenyl phosphate	0.615		ug/L	0.5102		121	65.2-151			

Matrix Spike Dup (A804106-MSD1)

Source: A181314-05

Prepared: 04/03/2018 Analyzed: 04/06/2018 02:15

Acetochlor	1.00	0.50	ug/L	1.042	ND	96.0	67.3-128	0.386	20	
Alachlor	1.25	0.50	ug/L	1.042	ND	120	58.2-150	11.3	20	
Atrazine	1.73	0.50	ug/L	1.042	0.768	92.8	70.1-120	4.26	20	
Chlorpyrifos	1.04	0.50	ug/L	1.042	ND	99.7	73.3-118	0.371	20	
Cyanazine	1.12	0.20	ug/L	1.042	ND	107	60.6-140	0.0547	20	
Desethylatrazine	1.34	0.50	ug/L	1.042	0.332	96.5	69.7-122	3.21	20	
Deisopropylatrazine	1.12	0.50	ug/L	1.042	0.204	87.6	48-121	8.48	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425264
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804106 - EPA 3510C

Matrix Spike Dup (A804106-MSD1)

Source: A181314-05

Prepared: 04/03/2018 Analyzed: 04/06/2018 02:15

Dimethenamid	1.11	0.50	ug/L	1.042	ND	106	63.7-123	0.973	20	
EPTC	0.942	0.50	ug/L	1.042	ND	90.5	58-109	4.33	20	
Ethalfuralin	0.864	0.50	ug/L	1.042	ND	82.9	59.3-129	15.4	20	
Fonofos	1.02	0.50	ug/L	1.042	ND	97.9	73.5-108	1.21	20	
Metolachlor	21.7	5.0	ug/L	1.042	19.5	215	40.9-156	1.41	20	M1, D
Metribuzin	1.10	0.50	ug/L	1.042	ND	105	70.9-136	4.50	20	
Pendimethalin	1.14	0.50	ug/L	1.042	ND	109	55.4-155	3.46	20	
Phorate	0.692	0.30	ug/L	1.042	ND	66.4	60.2-108	2.73	20	
Prometon	1.14	0.50	ug/L	1.042	ND	109	74.7-124	9.82	20	
Propachlor	1.07	0.50	ug/L	1.042	ND	103	72.3-115	2.23	20	
Propazine	0.992	0.50	ug/L	1.042	ND	95.2	73.7-124	0.484	20	
Simazine	1.06	0.50	ug/L	1.042	0.0619	96.1	74.8-114	2.86	20	
Terbufos	0.743	0.20	ug/L	1.042	ND	71.3	56.1-114	5.71	20	
Triallate	0.985	0.50	ug/L	1.042	ND	94.6	65.5-107	7.67	20	
Trifluralin	0.976	0.50	ug/L	1.042	ND	93.7	58-149	8.45	20	
Surrogate: Atrazine-d5	0.492		ug/L	0.5208		94.5	65.1-122			
Surrogate: Parathion-d10	0.580		ug/L	0.5208		111	22.3-159			
Surrogate: Triphenyl phosphate	0.696		ug/L	0.5208		134	65.2-151			



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425264
 Project Manager: Bob Michels

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804111 - EPA 3510C

Blank (A804111-BLK1)

Prepared: 04/04/2018 Analyzed: 04/06/2018 22:20

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.31 ug/L 2.016 115 44.2-121

LCS (A804111-BS1)

Prepared: 04/04/2018 Analyzed: 04/07/2018 01:52

2,4-D	3.13	0.50	ug/L	2.000		157	64.6-148			
2,4-DB	2.91	0.50	ug/L	2.000		145	66.7-143			
2,4,5-T	2.59	0.50	ug/L	2.000		129	63.4-133			
2,4,5-TP (Silvex)	3.08	0.50	ug/L	2.000		154	63-145			
Bentazon	1.38	0.50	ug/L	1.000		138	52.5-139			
Dicamba	2.92	0.50	ug/L	2.000		146	55.4-143			
MCPA	3.00	0.30	ug/L	2.000		150	33.5-143			
Picloram	1.13	0.50	ug/L	1.000		113	47.9-113			
Triclopyr	2.89	0.50	ug/L	2.000		144	65.1-141			

Surrogate: 2,4-D-d5

2.32 ug/L 2.016 115 44.2-121

LCS Dup (A804111-BSD1)

Prepared: 04/04/2018 Analyzed: 04/07/2018 02:27

2,4-D	3.06	0.50	ug/L	2.000		153	64.6-148	2.15	20	
2,4-DB	2.77	0.50	ug/L	2.000		139	66.7-143	4.71	20	
2,4,5-T	2.67	0.50	ug/L	2.000		133	63.4-133	3.13	20	
2,4,5-TP (Silvex)	3.15	0.50	ug/L	2.000		158	63-145	2.45	20	
Bentazon	1.40	0.50	ug/L	1.000		140	52.5-139	1.22	20	
Dicamba	3.19	0.50	ug/L	2.000		159	55.4-143	8.83	20	
MCPA	3.11	0.30	ug/L	2.000		155	33.5-143	3.37	20	
Picloram	1.11	0.50	ug/L	1.000		111	47.9-113	2.12	20	
Triclopyr	3.03	0.50	ug/L	2.000		152	65.1-141	4.96	20	

Surrogate: 2,4-D-d5

2.26 ug/L 2.016 112 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425264
Project Manager: Bob Michels

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

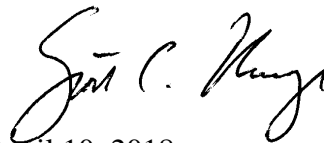
PaceProject#: 10425426
Sample Receipt Date: 03/27/2018
Client Project #: MPCA Freeway LF Wat
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 10, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 10, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 84%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 99-101% with a relative percent difference of 2.0%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New Hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10425426

Appendix A

Sample Management

WO#: 10425426
10425426

Minnesota Pollution Control Agency		Chain-of-Custody Form		Work Order Number:										
PROJECT/CLIENT INFO				Turnaround Time:										
Facility Code:	MPCA Freeway LF Waters		Program Code (MDH Lab Only):	Lab Name:										
Project Name:	MPCA Freeway LF Waters		Project Task Code:	Address: 18-00383										
Project Manager:					Phone No: EPIC Profile #38716									
Potential Hazard?	If yes, add information to Sampler Comments Section													
SAMPLE DETAILS				ANALYSIS REQUESTED										
SAMPLE TYPE CODES		LAB MATRIX CODES		FIELD MATRIX CODES										
Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe AR=Air BL=Biological Material OT=Other TS=Tissue Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample										
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	Lab Sample No.	#
FD-SB-B4	S	3/26/18				G	NW		partial List A	6	LIST A		001	1
FD-SB-A3	S	3/26/18				G	NW		partial List A	8	LIST A, B, C partial List A		002	2
														3
														4
														5
														6
														7
														8
														9
														10
Sampled By: DAVID ANDERSON			Sampler's Signature: David Anderson				Phone #:							
Receiving Comments:														
Relinquished By/Affiliation					Date/Time					Accepted By/ Affiliation				
(Sampler) David Anderson / Pace					3/27/18/0700					W Pace 3-27-18				

Lab Work Order Sticker

① partial List A for FD-SB-A3,
 ② continuation of partial List A for FD-SB-B4

Sample Condition Upon Receipt

Client Name: Pace FSD Project #: _____

WO# : 10425426
 PM: SCU Due Date: 04/10/18
 CLIENT: PCSI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 4.9 Cooler Temp Corrected (°C): 5.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: BYL 3/27/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No?	5. <u>not time on cont. for hex chrome</u>
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>only partial analysis of list a possible</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. <u>as stated on COC</u>
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res Chlorine? <input checked="" type="checkbox"/> Y
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1</u> <u>2 3/2</u> <u>1</u> <u>1/1</u> Initial when completed: _____ Lot # of added preservative: _____
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No

Comments/Resolution: Analyze sample 001 only, not enough volume for 002

Project Manager Review: Walter Bberg Date: 4/2/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent <i>(unfiltered)</i>	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

*- Analysis by MDH Laboratory

*** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Dissolved-Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Matt Unholz (MPCA).
 BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270-SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothal	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10425426

Report No.....10425426_1613TCDD_DFR

Page 8 of 14

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-B4		
Lab Sample ID	10425426001		
Filename	F180406B_08		
Injected By	ZMS		
Total Amount Extracted	501 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/26/2018 15:00
ICAL ID	F180405	Received	03/27/2018 08:15
CCal Filename(s)	F180406B_01	Extracted	04/04/2018 16:50
Method Blank ID	BLANK-61551	Analyzed	04/07/2018 14:54

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	84
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	106

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61551	Matrix	Water
Filename	U180407A_06	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 14:40
CCal Filename(s)	U180406B_14	Injected By	ZMS

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	93

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61552	Matrix	Water
Filename	U180407A_01	Dilution	NA
Total Amount Extracted	978 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 10:37
CCal Filename	U180406B_14	Injected By	ZMS
Method Blank ID	BLANK-61551		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.9	7.3	14.6	99
2,3,7,8-TCDD-37Cl4	10	9.7	3.7	15.8	97
2,3,7,8-TCDD-13C	100	90	25.0	141.0	90

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61553	Matrix	Water
Filename	U180407A_02	Dilution	NA
Total Amount Extracted	996 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 11:24
CCal Filename	U180406B_14	Injected By	ZMS
Method Blank ID	BLANK-61551		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	10	7.3	14.6	101
2,3,7,8-TCDD-37Cl4	10	8.4	3.7	15.8	84
2,3,7,8-TCDD-13C	100	81	25.0	141.0	81

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61552
 Spike 1 Filename U180407A_01

Spike 2 ID LCSD-61553
 Spike 2 Filename U180407A_02

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	99	101	2.0

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

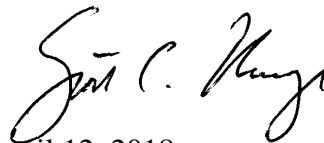
PaceProject#: 10425439
Sample Receipt Date: 03/29/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 12, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 12, 2018

DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extracts was recovered at 73%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 99-101% with a relative percent difference of 2.0%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10425439

Appendix A

Sample Management

WO#: 10425439



Report No.: 10425439_1613TCDD_DFR

Study Form		Work Order Number:		COC Type:		Page: 1 of									
		Turnaround Time:		COC ID:		FOR LAB USE ONLY									
SCT/CLIENT INFO				LABORATORY											
Facility Code: MPCA Freeway LF Waters		Program Code (MDH Lab Only):		Lab Name:											
Project Name: MPCA Freeway LF Waters		Project Task Code:		Address: 15-00383											
Project Manager:				EPIC Profile # 38716											
Potential Hazard?		If yes, add information to Sampler Comments Section		Phone No.:		Lab Work Order Sticker									
SAMPLE DETAILS				ANALYSIS REQUESTED											
SAMPLE TYPE CODES S-Routine Sample S-IVP-Integrated Vertical Profile Sample S-CWOP-Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		FIELD MATRIX CODES Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample											
		QC CODES QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample													
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	LABORATORY	Lab Sample No.	#
FD-SB-A3	S	3/29/18	1220			G	NW	Wtr-Ground			7	XX		001	1
FD-SB-B4	S	3/29/18	1340			G	NW	Wtr-Ground			2	XX		002	2
FD-SB-D5	S	3/29/18	1300			G	NW	Wtr-Ground			25				3
Field Replicate	QC-FR	3/29/18				G	NW	Wtr-Ground			25				4
															5
															6
															7
															8
															9
															10
Sampled By: David Anderson				Sampler's Signature: David Anderson				Phone #:							
Receiving Comments:															
Relinquished By/Affiliation				Date/Time				Accepted By/Affiliation				Date/Time			
(Sampler) David Anderson / PACE Analyzed!				3/29/18/1626				Wh PACE				3-29-18 1626			

① collected from FD-SB-A3 = (6) GL, (1) GL H=1
 ② collected from FD-SB-B4 = (2) GL

6.9, 7.1, 6.8, 8.2 °C

Sample Condition Upon Receipt

Client Name: MPLA-FSD

Project #: **WO#: 10425439**
 PM: SCU Due Date: 04/12/18
 CLIENT: PASI-MNFL

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: _____ Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.2 / 6.9 / 6.4 / 6.0 Cooler Temp Corrected (°C): 6.9 / 7.7
 Temp should be above freezing to 6°C Correction Factor: 10.2 Biological Tissue Frozen? Yes No N/A
 Date and Initials of Person Examining Contents: 3/29/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>Samples not labeled. Came in individual coolers w/ sample ID</u>
-Includes Date/Time/ID/Analysis Matrix: <u>WST</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____
 Field Data Required? Yes No

Project Manager Review: Nathan Boberg Date: 4/2/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc.
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury - Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Dissolved-Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/18/18 email from Mark Umholtz (WPCA).
 BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA-8270-SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10425439

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-A3		
Lab Sample ID	10425439001		
Filename	F180406B_09		
Injected By	ZMS		
Total Amount Extracted	503 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/29/2018 12:30
ICAL ID	F180405	Received	03/29/2018 16:26
CCal Filename(s)	F180406B_01	Extracted	04/04/2018 16:50
Method Blank ID	BLANK-61551	Analyzed	04/07/2018 15:39

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	93

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-SB-B4		
Lab Sample ID	10425439002		
Filename	F180406B_10		
Injected By	ZMS		
Total Amount Extracted	511 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	03/29/2018 13:40
ICAL ID	F180405	Received	03/29/2018 16:26
CCal Filename(s)	F180406B_01	Extracted	04/04/2018 16:50
Method Blank ID	BLANK-61551	Analyzed	04/07/2018 16:24

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	73
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	96

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61551	Matrix	Water
Filename	U180407A_06	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 14:40
CCal Filename(s)	U180406B_14	Injected By	ZMS

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	80
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	93

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61552	Matrix	Water
Filename	U180407A_01	Dilution	NA
Total Amount Extracted	978 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 10:37
CCal Filename	U180406B_14	Injected By	ZMS
Method Blank ID	BLANK-61551		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	9.9	7.3	14.6	99
2,3,7,8-TCDD-37Cl4	10	9.7	3.7	15.8	97
2,3,7,8-TCDD-13C	100	90	25.0	141.0	90

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61553	Matrix	Water
Filename	U180407A_02	Dilution	NA
Total Amount Extracted	996 mL	Extracted	04/04/2018 16:50
ICAL ID	U180405	Analyzed	04/07/2018 11:24
CCal Filename	U180406B_14	Injected By	ZMS
Method Blank ID	BLANK-61551		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	10	7.3	14.6	101
2,3,7,8-TCDD-37Cl4	10	8.4	3.7	15.8	84
2,3,7,8-TCDD-13C	100	81	25.0	141.0	81

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61552
 Spike 1 Filename U180407A_01

Spike 2 ID LCSD-61553
 Spike 2 Filename U180407A_02

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	99	101	2.0

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 02, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 29, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Bob Michels
bob.michels@pacelabs.com
(612)709-5046
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

Pennsylvania Certification IDs

Pennsylvania/TNI Certification #: 65-00282	Vermont Dept. of Health: ID# VT-0282
Puerto Rico Certification #: PA01457	Virgin Island/PADEP Certification
Rhode Island Certification #: 65-00282	Virginia/VELAP Certification #: 9526
South Dakota Certification	Washington Certification #: C868
Tennessee Certification #: 02867	West Virginia DEP Certification #: 143
Texas/TNI Certification #: T104704188-17-3	West Virginia DHHR Certification #: 9964C
Utah/TNI Certification #: PA014572017-9	Wisconsin Approve List for Rad
USDA Soil Permit #: P330-17-00091	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268	Ohio VAP Certification #: CL-0065
Illinois Certification #: 200074	Oklahoma Certification #: 2017-124
Indiana Certification #: C-49-06	Texas Certification #: T104704355-18-12
Kansas/NELAP Certification #:E-10177	West Virginia Certification #: 330
Kentucky UST Certification #: 80226	Wisconsin Certification #: 999788130
Kentucky WW Certification #:98019	USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10425440001	FD-SB-A3	Water	03/29/18 12:30	03/29/18 16:26
10425440002	FD-SB-B4	Water	03/29/18 13:40	03/29/18 16:26
10425440003	FD-SB-D5	Water	03/29/18 13:00	03/29/18 16:26
10425440004	Field Replicate 1	Water	03/29/18 00:00	03/29/18 16:26

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10425440001	FD-SB-A3	EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8270D	AT1	38	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
10425440002	FD-SB-B4	EPA 8270D	AT1	38	PASI-M
10425440003	FD-SB-D5	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	1	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 548.1	LAJ	1	PASI-O
		EPA 524.2	AEZ	4	PASI-M
		EPA 900.0	NJV	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 4500-CIO2	AGS	1	PASI-O
		EPA 300.0	AR3	1	PASI-M
		EPA 300.1	CMB	1	PASI-O
EPA 300.1	CMB	1	PASI-O		
10425440004	Field Replicate 1	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	1	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	BJW	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 548.1	LAJ	1	PASI-O
		EPA 524.2	AEZ	4	PASI-M
		EPA 900.0	NJV	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 4500-CIO2	AGS	1	PASI-O
		EPA 300.0	AR3	1	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-A3	Lab ID: 10425440001	Collected: 03/29/18 12:30	Received: 03/29/18 16:26	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	309-00-2	
alpha-BHC	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	319-84-6	
beta-BHC	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	319-85-7	
delta-BHC	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	58-89-9	
Chlordane (Technical)	ND	ug/L	0.58	1	04/03/18 10:22	04/06/18 18:55	57-74-9	
alpha-Chlordane	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	5103-71-9	
gamma-Chlordane	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	5103-74-2	
4,4'-DDD	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	72-54-8	
4,4'-DDE	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	72-55-9	
4,4'-DDT	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	50-29-3	
Dieldrin	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	60-57-1	
Endosulfan I	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	959-98-8	
Endosulfan II	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	1031-07-8	
Endrin	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	72-20-8	
Endrin aldehyde	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	7421-93-4	
Endrin ketone	ND	ug/L	0.12	1	04/03/18 10:22	04/06/18 18:55	53494-70-5	
Heptachlor	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	76-44-8	
Heptachlor epoxide	ND	ug/L	0.058	1	04/03/18 10:22	04/06/18 18:55	1024-57-3	
Methoxychlor	ND	ug/L	0.58	1	04/03/18 10:22	04/06/18 18:55	72-43-5	
Toxaphene	ND	ug/L	1.7	1	04/03/18 10:22	04/06/18 18:55	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	85	%	62-125	1	04/03/18 10:22	04/06/18 18:55	877-09-8	
Decachlorobiphenyl (S)	39	%	30-143	1	04/03/18 10:22	04/06/18 18:55	2051-24-3	
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.12	1	04/03/18 10:20	04/04/18 13:31	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	68	%	30-125	1	04/03/18 10:20	04/04/18 13:31	877-09-8	
Decachlorobiphenyl (S)	53	%	30-125	1	04/03/18 10:20	04/04/18 13:31	2051-24-3	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	83-32-9	
Anthracene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	120-12-7	
Benzo(a)pyrene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	50-32-8	
Benzoic acid	ND	ug/L	58.1	1	04/04/18 09:03	04/06/18 21:08	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	101-55-3	
Butylbenzylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	85-68-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-A3 **Lab ID: 10425440001** Collected: 03/29/18 12:30 Received: 03/29/18 16:26 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
------------	---------	-------	--------------	----	----------	----------	---------	------

8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

bis(2-Chloroethyl) ether	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	111-44-4	
2-Chlorophenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	58.1	1	04/04/18 09:03	04/06/18 21:08	91-94-1	
2,4-Dichlorophenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	120-83-2	
Diethylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	84-66-2	
2,4-Dimethylphenol	ND	ug/L	58.1	1	04/04/18 09:03	04/06/18 21:08	105-67-9	
Dimethylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	131-11-3	
Di-n-butylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	84-74-2	
2,4-Dinitrophenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	51-28-5	
Di-n-octylphthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	117-81-7	
Fluoranthene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	206-44-0	
Fluorene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	86-73-7	
Hexachlorobenzene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	58.1	1	04/04/18 09:03	04/06/18 21:08	77-47-4	
Hexachloroethane	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	67-72-1	
Isophorone	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	78-59-1	
2-Methylnaphthalene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	23.3	1	04/04/18 09:03	04/06/18 21:08		
N-Nitrosodiphenylamine	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	86-30-6	
Pentachlorophenol	ND	ug/L	23.3	1	04/04/18 09:03	04/06/18 21:08	87-86-5	
Phenanthrene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	85-01-8	
Phenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	108-95-2	
Pyrene	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	11.6	1	04/04/18 09:03	04/06/18 21:08	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%	60-125	1	04/04/18 09:03	04/06/18 21:08	4165-60-0	
2-Fluorobiphenyl (S)	83	%	56-125	1	04/04/18 09:03	04/06/18 21:08	321-60-8	
p-Terphenyl-d14 (S)	90	%	58-125	1	04/04/18 09:03	04/06/18 21:08	1718-51-0	
Phenol-d6 (S)	78	%	58-125	1	04/04/18 09:03	04/06/18 21:08	13127-88-3	
2-Fluorophenol (S)	78	%	55-125	1	04/04/18 09:03	04/06/18 21:08	367-12-4	
2,4,6-Tribromophenol (S)	99	%	65-125	1	04/04/18 09:03	04/06/18 21:08	118-79-6	

1664 HEM, Oil and Grease

Analytical Method: EPA 1664A OG

Oil and Grease	ND	mg/L	5.2	1		04/11/18 10:37		1M
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Sample: FD-SB-B4 **Lab ID: 10425440002** Collected: 03/29/18 13:40 Received: 03/29/18 16:26 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

Acenaphthene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	83-32-9	
Anthracene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	50-32-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-B4		Lab ID: 10425440002	Collected: 03/29/18 13:40	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Benzoic acid	ND	ug/L	53.8	1	04/04/18 09:03	04/06/18 21:36	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	111-44-4	
2-Chlorophenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	53.8	1	04/04/18 09:03	04/06/18 21:36	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	120-83-2	
Diethylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	84-66-2	
2,4-Dimethylphenol	ND	ug/L	53.8	1	04/04/18 09:03	04/06/18 21:36	105-67-9	
Dimethylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	117-81-7	
Fluoranthene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	206-44-0	
Fluorene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	86-73-7	
Hexachlorobenzene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	53.8	1	04/04/18 09:03	04/06/18 21:36	77-47-4	
Hexachloroethane	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	67-72-1	
Isophorone	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.5	1	04/04/18 09:03	04/06/18 21:36		
N-Nitrosodiphenylamine	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	86-30-6	
Pentachlorophenol	ND	ug/L	21.5	1	04/04/18 09:03	04/06/18 21:36	87-86-5	
Phenanthrene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	85-01-8	
Phenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	108-95-2	
Pyrene	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.8	1	04/04/18 09:03	04/06/18 21:36	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	83	%	60-125	1	04/04/18 09:03	04/06/18 21:36	4165-60-0	
2-Fluorobiphenyl (S)	88	%	56-125	1	04/04/18 09:03	04/06/18 21:36	321-60-8	
p-Terphenyl-d14 (S)	89	%	58-125	1	04/04/18 09:03	04/06/18 21:36	1718-51-0	
Phenol-d6 (S)	88	%	58-125	1	04/04/18 09:03	04/06/18 21:36	13127-88-3	
2-Fluorophenol (S)	84	%	55-125	1	04/04/18 09:03	04/06/18 21:36	367-12-4	
2,4,6-Tribromophenol (S)	110	%	65-125	1	04/04/18 09:03	04/06/18 21:36	118-79-6	

Sample: FD-SB-D5		Lab ID: 10425440003	Collected: 03/29/18 13:00	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates		Analytical Method: EPA 531.1						
Aldicarb	ND	ug/L	2.0	1		04/13/18 01:19	116-06-3	M1
Carbofuran	ND	ug/L	2.0	1		04/13/18 01:19	1563-66-2	M1
Surrogates								
BDMC (S)	131	%	80-120	1		04/13/18 01:19		S3

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-D5	Lab ID: 10425440003	Collected: 03/29/18 13:00	Received: 03/29/18 16:26	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates	Analytical Method: EPA 531.1							
Surrogates								
BDMC (S)	74	%	80-120	1		04/06/18 16:50		S0
547 HPLC Glyphosate	Analytical Method: EPA 547							
Glyphosate	ND	ug/L	6.0	1		04/04/18 14:40		
549.2 HPLC Paraquat Diquat	Analytical Method: EPA 549.2 Preparation Method: EPA 549.2							
Diquat	ND	ug/L	0.40	1	04/04/18 23:02	04/05/18 20:25	85-00-7	
8011 GCS EDB and DBCP	Analytical Method: EPA 8011 Preparation Method: EPA 8011							
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/04/18 07:55	04/04/18 23:52	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/04/18 07:55	04/04/18 23:52	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	107	%	30-150	1	04/04/18 07:55	04/04/18 23:52	460-00-4	
8015M Alcohols in water	Analytical Method: EPA 8015 Alcohol-Glycol							
Methanol	ND	mg/L	5.0	1		04/05/18 10:51	67-56-1	
8015M Glycols in water	Analytical Method: EPA 8015 Alcohol-Glycol							
Ethylene glycol	ND	mg/L	5.0	1		04/06/18 09:29	107-21-1	
8315A GCSV Aldehydes	Analytical Method: EPA 8315A Preparation Method: EPA 8315A							
Formaldehyde	ND	ug/L	100	1	04/04/18 12:52	04/06/18 15:33	50-00-0	H2
8316 W GCSV Acrylamide	Analytical Method: EPA 8316							
Acrylamide	841	ug/L	20.0	1		04/03/18 16:54	79-06-1	
548.1 GCS Endothall	Analytical Method: EPA 548.1 Preparation Method: EPA 548.1							
Endothall	ND	ug/L	9.0	1	04/04/18 16:08	04/11/18 16:40		L1,L2
524.2 MSV	Analytical Method: EPA 524.2							
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/06/18 18:18		
Surrogates								
4-Bromofluorobenzene (S)	101	%	75-125	1		04/06/18 18:18	460-00-4	
Toluene-d8 (S)	100	%	75-125	1		04/06/18 18:18	2037-26-5	
1,2-Dichloroethane-d4 (S)	102	%	75-125	1		04/06/18 18:18	17060-07-0	
4500CIO2 Chlorine Dioxide	Analytical Method: SM 4500-CIO2							
Chlorine Dioxide	1.1	mg/L	0.10	1		04/06/18 13:42		H6
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	80.1	mg/L	1.2	1		04/12/18 12:00	16887-00-6	FS
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	50.0	10		04/08/18 16:17		D3

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-D5		Lab ID: 10425440003	Collected: 03/29/18 13:00	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.1 Oxihalide IC Anions 28d		Analytical Method: EPA 300.1						
Bromate	ND	ug/L	10.0	10		04/08/18 16:17	15541-45-4	D3
Sample: Field Replicate 1		Lab ID: 10425440004	Collected: 03/29/18 00:00	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
531.1 HPLC Carbamates		Analytical Method: EPA 531.1						
Aldicarb	ND	ug/L	2.0	1		04/06/18 17:28	116-06-3	
Carbofuran	ND	ug/L	2.0	1		04/06/18 17:28	1563-66-2	
Surrogates								
BDMC (S)	93	%	80-120	1		04/06/18 17:28		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		04/04/18 14:56		
549.2 HPLC Paraquat Diquat		Analytical Method: EPA 549.2 Preparation Method: EPA 549.2						
Diquat	ND	ug/L	0.40	1	04/04/18 23:02	04/05/18 20:32	85-00-7	
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/04/18 07:55	04/05/18 00:18	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/04/18 07:55	04/05/18 00:18	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	97	%	30-150	1	04/04/18 07:55	04/05/18 00:18	460-00-4	
8015M Alcohols in water		Analytical Method: EPA 8015 Alcohol-Glycol						
Methanol	ND	mg/L	5.0	1		04/05/18 11:00	67-56-1	
8015M Glycols in water		Analytical Method: EPA 8015 Alcohol-Glycol						
Ethylene glycol	ND	mg/L	5.0	1		04/06/18 09:38	107-21-1	
8315A GCSV Aldehydes		Analytical Method: EPA 8315A Preparation Method: EPA 8315A						
Formaldehyde	ND	ug/L	100	1	04/04/18 12:52	04/06/18 15:49	50-00-0	H2
8316 W GCSV Acrylamide		Analytical Method: EPA 8316						
Acrylamide	ND	ug/L	20.0	1		04/03/18 17:02	79-06-1	
548.1 GCS Endothall		Analytical Method: EPA 548.1 Preparation Method: EPA 548.1						
Endothall	ND	ug/L	9.0	1	04/04/18 16:08	04/11/18 16:52		L1,L2
524.2 MSV		Analytical Method: EPA 524.2						
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/06/18 18:41		
Surrogates								
4-Bromofluorobenzene (S)	100	%	75-125	1		04/06/18 18:41	460-00-4	
Toluene-d8 (S)	97	%	75-125	1		04/06/18 18:41	2037-26-5	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: Field Replicate 1		Lab ID: 10425440004	Collected: 03/29/18 00:00	Received: 03/29/18 16:26	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
524.2 MSV	Analytical Method: EPA 524.2							
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	75-125	1		04/06/18 18:41	17060-07-0	
4500ClO2 Chlorine Dioxide	Analytical Method: SM 4500-ClO2							
Chlorine Dioxide	0.81	mg/L	0.10	1		04/06/18 13:42		H6
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	82.8	mg/L	1.2	1		04/12/18 12:15	16887-00-6	FS
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	50.0	10		04/08/18 17:00		D3
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/08/18 17:00	15541-45-4	D3

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 438337 Analysis Method: EPA 531.1
 QC Batch Method: EPA 531.1 Analysis Description: 531.1 HPLC Carbamate
 Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2380051 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	04/06/18 14:17	
Carbofuran	ug/L	ND	2.0	04/06/18 14:17	
BDMC (S)	%	80	80-120	04/06/18 14:17	

LABORATORY CONTROL SAMPLE: 2380052

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	8.4	84	80-120	
Carbofuran	ug/L	10	10.1	101	80-120	
BDMC (S)	%			87	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2380053 2380054

Parameter	Units	10425440003		2380053		2380054		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Aldicarb	ug/L	ND	10	10	5.0	5.3	50	53	80-120	5	20	M1
Carbofuran	ug/L	ND	10	10	5.6	7.5	56	75	80-120	29	20	M1, R1
BDMC (S)	%						54	54	80-120			S0

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 438883 Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1 Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10425440003

METHOD BLANK: 2382546 Matrix: Water
Associated Lab Samples: 10425440003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	04/12/18 22:46	
Carbofuran	ug/L	ND	2.0	04/12/18 22:46	
BDMC (S)	%	105	80-120	04/12/18 22:46	

LABORATORY CONTROL SAMPLE: 2382547

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	9.4	94	80-120	
Carbofuran	ug/L	10	11.4	114	80-120	
BDMC (S)	%			126	80-120 S0	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2382548 2382549

Parameter	Units	10425440003		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Aldicarb	ug/L	ND	10	10	10	12.8	12.9	128	129	80-120	1	20	M1		
Carbofuran	ug/L	ND	10	10	10	12.4	12.6	124	126	80-120	1	20	M1		
BDMC (S)	%							121	120	80-120			S0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 437576 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2375438 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/04/18 11:18	

LABORATORY CONTROL SAMPLE: 2375439

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	46.9	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375440 2375441

Parameter	Units	35383136002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	50.8	51.9	102	104	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2375442 2375443

Parameter	Units	4610024001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<6.0	50	50	53.0	54.6	106	109	80-120	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 435508 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2011284 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/04/18 13:46	

LABORATORY CONTROL SAMPLE: 2011285

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	56.4	113	79-111	L3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011376 2011377

Parameter	Units	60266710003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Methanol	mg/L	ND	50	50	46.8	46.4	94	93	43-138	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 435360 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2010801

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/05/18 16:45	

LABORATORY CONTROL SAMPLE: 2010802

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	28.4	114	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2012497 2012498

Parameter	Units	50193471003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Ethylene glycol	mg/L	ND	25	25	18.3	20.4	72	81	38-154	11	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 19422

Analysis Method: EPA 8316

QC Batch Method: EPA 8316

Analysis Description: 8316 W GCSV Acrylamide

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 77113

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/03/18 16:28	

LABORATORY CONTROL SAMPLE: 77114

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	882	88	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77115

77116

Parameter	Units	10425264002		77115		77116		% Rec Limits	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Acrylamide	ug/L	ND	1000	1000	939	903	94	90	78-135	4	16

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 531079 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2883584 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/06/18 12:23	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/06/18 12:23	
4-Bromofluorobenzene (S)	%.	99	75-125	04/06/18 12:23	
Toluene-d8 (S)	%.	99	75-125	04/06/18 12:23	

LABORATORY CONTROL SAMPLE: 2883585

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	80.8	101	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2885151 2885152

Parameter	Units	10426572001		2885151		2885152		% Rec	% Rec	% Rec	Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	76.8	82.7	96	103	70-130	7	20		
1,2-Dichloroethane-d4 (S)	%.						101	99	75-125				
4-Bromofluorobenzene (S)	%.						101	99	75-125				
Toluene-d8 (S)	%.						99	98	75-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 437555 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2375305 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/11/18 14:41	

LABORATORY CONTROL SAMPLE: 2375306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	ND	0	64-137	L2

LABORATORY CONTROL SAMPLE: 2375307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	22.1	246	50-150	L1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376829 2376830

Parameter	Units	35383245001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Endothall	ug/L	<4.3	50	50	10.6	5.9J	21	12	64-137		30	M0		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376831 2376833

Parameter	Units	35382684001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Endothall	ug/L	4.3U	50	50	9.8	6.6J	20	13	64-137		30	M0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 437867 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2376996 Matrix: Water
Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/05/18 18:44	

LABORATORY CONTROL SAMPLE: 2376997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.6	78	70-130	

LABORATORY CONTROL SAMPLE: 2376998

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.58	145	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2377632 2377635

Parameter	Units	35382816003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Diquat	ug/L	<0.30	2	1.9	2	1.8	93	90	70-130	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2377634 2377635

Parameter	Units	35382800001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Diquat	ug/L	<0.30	2	1.9	2	1.9	95	95	70-130	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 530540 Analysis Method: EPA 8011
 QC Batch Method: EPA 8011 Analysis Description: GCS 8011 EDB DBCP
 Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2879655 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/04/18 18:16	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/04/18 18:16	
4-Bromofluorobenzene (S)	%.	96	30-150	04/04/18 18:16	

LABORATORY CONTROL SAMPLE & LCSD: 2879656

2879657

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.11	0.11	98	100	60-140	2	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.11	98	98	60-140	1	20	
4-Bromofluorobenzene (S)	%.				101	105	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 530316

Analysis Method: EPA 8081B

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8081B GCS Pesticides

Associated Lab Samples: 10425440001

METHOD BLANK: 2878474

Matrix: Water

Associated Lab Samples: 10425440001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/06/18 16:47	
4,4'-DDE	ug/L	ND	0.10	04/06/18 16:47	
4,4'-DDT	ug/L	ND	0.10	04/06/18 16:47	
Aldrin	ug/L	ND	0.050	04/06/18 16:47	
alpha-BHC	ug/L	ND	0.050	04/06/18 16:47	
alpha-Chlordane	ug/L	ND	0.050	04/06/18 16:47	
beta-BHC	ug/L	ND	0.050	04/06/18 16:47	
Chlordane (Technical)	ug/L	ND	0.50	04/06/18 16:47	
delta-BHC	ug/L	ND	0.050	04/06/18 16:47	
Dieldrin	ug/L	ND	0.10	04/06/18 16:47	
Endosulfan I	ug/L	ND	0.050	04/06/18 16:47	
Endosulfan II	ug/L	ND	0.10	04/06/18 16:47	
Endosulfan sulfate	ug/L	ND	0.10	04/06/18 16:47	
Endrin	ug/L	ND	0.10	04/06/18 16:47	
Endrin aldehyde	ug/L	ND	0.10	04/06/18 16:47	
Endrin ketone	ug/L	ND	0.10	04/06/18 16:47	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/06/18 16:47	
gamma-Chlordane	ug/L	ND	0.050	04/06/18 16:47	
Heptachlor	ug/L	ND	0.050	04/06/18 16:47	
Heptachlor epoxide	ug/L	ND	0.050	04/06/18 16:47	
Methoxychlor	ug/L	ND	0.50	04/06/18 16:47	
Toxaphene	ug/L	ND	1.5	04/06/18 16:47	
Decachlorobiphenyl (S)	%	84	30-143	04/06/18 16:47	
Tetrachloro-m-xylene (S)	%	84	62-125	04/06/18 16:47	

LABORATORY CONTROL SAMPLE: 2878475

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4,4'-DDD	ug/L	1	1.0	100	67-125	
4,4'-DDE	ug/L	1	0.96	96	68-125	
4,4'-DDT	ug/L	1	1.0	100	66-125	
Aldrin	ug/L	.5	0.39	79	46-125	
alpha-BHC	ug/L	.5	0.48	96	66-125	
alpha-Chlordane	ug/L	.5	0.46	92	72-125	
beta-BHC	ug/L	.5	0.47	94	72-125	
delta-BHC	ug/L	.5	0.44	89	37-141	
Dieldrin	ug/L	1	1.0	103	71-125	
Endosulfan I	ug/L	.5	0.43	87	69-125	
Endosulfan II	ug/L	1	1.0	100	73-125	
Endosulfan sulfate	ug/L	1	0.90	90	63-127	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

LABORATORY CONTROL SAMPLE: 2878475

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endrin	ug/L	1	0.95	95	72-125	
Endrin aldehyde	ug/L	1	0.95	95	70-125	
Endrin ketone	ug/L	1	1.0	102	72-127	
gamma-BHC (Lindane)	ug/L	.5	0.48	96	69-125	
gamma-Chlordane	ug/L	.5	0.41	82	64-125	
Heptachlor	ug/L	.5	0.44	88	54-125	
Heptachlor epoxide	ug/L	.5	0.47	93	72-125	
Methoxychlor	ug/L	5	4.9	99	67-127	
Decachlorobiphenyl (S)	%			86	30-143	
Tetrachloro-m-xylene (S)	%			88	62-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2878476 2878477

Parameter	Units	10425808008		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec							
4,4'-DDD	ug/L	ND	1.2	1.3	1.1	1.2	92	93	70-130	8	20				
4,4'-DDE	ug/L	ND	1.2	1.3	1.1	1.2	91	92	70-130	8	20				
4,4'-DDT	ug/L	ND	1.2	1.3	1.4	1.4	109	109	70-130	6	20				
Aldrin	ug/L	ND	.62	.67	0.46	0.51	74	76	70-130	10	20				
alpha-BHC	ug/L	ND	.62	.67	0.58	0.63	93	94	70-130	7	20				
alpha-Chlordane	ug/L	ND	.62	.67	0.64	0.68	102	103	70-130	7	20				
beta-BHC	ug/L	ND	.62	.67	0.57	0.62	92	92	70-130	7	20				
delta-BHC	ug/L	ND	.62	.67	0.55	0.59	88	89	70-130	8	20				
Dieldrin	ug/L	ND	1.2	1.3	1.2	1.3	97	98	70-130	8	20				
Endosulfan I	ug/L	ND	.62	.67	0.49	0.53	79	80	70-130	7	20				
Endosulfan II	ug/L	ND	1.2	1.3	1.1	1.2	92	93	70-130	8	20				
Endosulfan sulfate	ug/L	ND	1.2	1.3	1.0	1.1	83	84	70-130	8	20				
Endrin	ug/L	ND	1.2	1.3	1.3	1.4	102	102	70-130	7	20				
Endrin aldehyde	ug/L	ND	1.2	1.3	1.1	1.2	87	87	70-130	7	20				
Endrin ketone	ug/L	ND	1.2	1.3	1.2	1.3	96	97	70-130	7	20				
gamma-BHC (Lindane)	ug/L	ND	.62	.67	0.58	0.62	92	93	70-130	7	20				
gamma-Chlordane	ug/L	ND	.62	.67	0.48	0.52	77	78	70-130	8	20				
Heptachlor	ug/L	ND	.62	.67	0.53	0.58	85	87	70-130	9	20				
Heptachlor epoxide	ug/L	ND	.62	.67	0.70	0.75	113	112	70-130	6	20				
Methoxychlor	ug/L	ND	6.2	6.7	6.5	7.0	104	104	70-130	6	20				
Decachlorobiphenyl (S)	%						67	67	30-143						
Tetrachloro-m-xylene (S)	%						86	87	62-125						

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 530321 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10425440001

METHOD BLANK: 2878485 Matrix: Water
Associated Lab Samples: 10425440001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/04/18 13:01	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/04/18 13:01	
Decachlorobiphenyl (S)	%	84	30-125	04/04/18 13:01	
Tetrachloro-m-xylene (S)	%	57	30-125	04/04/18 13:01	

LABORATORY CONTROL SAMPLE & LCSD: 2878486

Parameter	Units	2878487								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.4	1.4	71	72	47-125	2	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.5	1.6	77	78	54-125	2	20	
Decachlorobiphenyl (S)	%				77	77	30-125			
Tetrachloro-m-xylene (S)	%				66	65	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 530573

Analysis Method: EPA 8270D

QC Batch Method: EPA 3520

Analysis Description: 8270D Water MSSV

Associated Lab Samples: 10425440001, 10425440002

METHOD BLANK: 2879730

Matrix: Water

Associated Lab Samples: 10425440001, 10425440002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/06/18 16:27	
2,4-Dichlorophenol	ug/L	ND	10.0	04/06/18 16:27	
2,4-Dimethylphenol	ug/L	ND	50.0	04/06/18 16:27	
2,4-Dinitrophenol	ug/L	ND	10.0	04/06/18 16:27	
2-Chlorophenol	ug/L	ND	10.0	04/06/18 16:27	
2-Methylnaphthalene	ug/L	ND	10.0	04/06/18 16:27	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/06/18 16:27	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/06/18 16:27	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/06/18 16:27	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/06/18 16:27	
Acenaphthene	ug/L	ND	10.0	04/06/18 16:27	
Anthracene	ug/L	ND	10.0	04/06/18 16:27	
Benzo(a)pyrene	ug/L	ND	10.0	04/06/18 16:27	
Benzoic acid	ug/L	ND	50.0	04/06/18 16:27	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/06/18 16:27	
bis(2-Ethylhexyl)phthalate	ug/L	10.9	10.0	04/06/18 16:27	
Butylbenzylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Di-n-butylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Di-n-octylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Diethylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Dimethylphthalate	ug/L	ND	10.0	04/06/18 16:27	
Fluoranthene	ug/L	ND	10.0	04/06/18 16:27	
Fluorene	ug/L	ND	10.0	04/06/18 16:27	
Hexachlorobenzene	ug/L	ND	10.0	04/06/18 16:27	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/06/18 16:27	
Hexachloroethane	ug/L	ND	10.0	04/06/18 16:27	
Isophorone	ug/L	ND	10.0	04/06/18 16:27	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/06/18 16:27	
Pentachlorophenol	ug/L	ND	20.0	04/06/18 16:27	
Phenanthrene	ug/L	ND	10.0	04/06/18 16:27	
Phenol	ug/L	ND	10.0	04/06/18 16:27	
Pyrene	ug/L	ND	10.0	04/06/18 16:27	
2,4,6-Tribromophenol (S)	%	99	65-125	04/06/18 16:27	
2-Fluorobiphenyl (S)	%	80	56-125	04/06/18 16:27	
2-Fluorophenol (S)	%	77	55-125	04/06/18 16:27	
Nitrobenzene-d5 (S)	%	74	60-125	04/06/18 16:27	
p-Terphenyl-d14 (S)	%	104	58-125	04/06/18 16:27	
Phenol-d6 (S)	%	77	58-125	04/06/18 16:27	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

LABORATORY CONTROL SAMPLE & LCSD: 2879731		2879732								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	42.4	45.3	85	91	74-125	7	20	
2,4-Dichlorophenol	ug/L	50	42.2	44.4	84	89	68-125	5	20	
2,4-Dimethylphenol	ug/L	50	36.8J	38.4J	74	77	33-125		20	
2,4-Dinitrophenol	ug/L	50	38.9	45.5	78	91	30-127	16	20	
2-Chlorophenol	ug/L	50	40.0	41.7	80	83	61-125	4	20	
2-Methylnaphthalene	ug/L	50	41.1	43.8	82	88	67-125	6	20	
2-Methylphenol(o-Cresol)	ug/L	50	39.6	40.3	79	81	63-125	2	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	39.8	42.6	80	85	67-125	7	20	
3,3'-Dichlorobenzidine	ug/L	50	48.2J	49.8J	96	100	60-125		20	
4-Bromophenylphenyl ether	ug/L	50	46.0	47.6	92	95	75-125	4	20	
Acenaphthene	ug/L	50	42.5	45.4	85	91	74-125	7	20	
Anthracene	ug/L	50	42.9	45.8	86	92	75-125	7	20	
Benzo(a)pyrene	ug/L	50	44.6	47.9	89	96	75-125	7	20	
Benzoic acid	ug/L	50	26.4J	42.4J	53	85	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	35.1	37.3	70	75	55-125	6	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	46.8	49.9	94	100	72-129	6	20	
Butylbenzylphthalate	ug/L	50	46.2	49.1	92	98	69-127	6	20	
Di-n-butylphthalate	ug/L	50	46.1	49.0	92	98	75-125	6	20	
Di-n-octylphthalate	ug/L	50	45.9	50.3	92	101	69-131	9	20	
Diethylphthalate	ug/L	50	45.1	48.0	90	96	75-125	6	20	
Dimethylphthalate	ug/L	50	45.6	48.7	91	97	75-125	7	20	
Fluoranthene	ug/L	50	46.1	49.1	92	98	75-125	6	20	
Fluorene	ug/L	50	43.6	46.5	87	93	75-125	7	20	
Hexachlorobenzene	ug/L	50	47.4	49.9	95	100	74-125	5	20	
Hexachlorocyclopentadiene	ug/L	50	21.3J	23.3J	43	47	30-125		20	
Hexachloroethane	ug/L	50	35.7	38.7	71	77	30-125	8	20	
Isophorone	ug/L	50	39.7	42.4	79	85	72-125	6	20	
N-Nitrosodiphenylamine	ug/L	50	45.1	46.8	90	94	75-125	4	20	
Pentachlorophenol	ug/L	50	47.1	50.1	94	100	52-125	6	20	
Phenanthrene	ug/L	50	43.7	47.0	87	94	75-125	7	20	
Phenol	ug/L	50	37.2	39.4	74	79	59-125	6	20	
Pyrene	ug/L	50	46.6	49.5	93	99	75-125	6	20	
2,4,6-Tribromophenol (S)	%				97	101	65-125			
2-Fluorobiphenyl (S)	%				81	87	56-125			
2-Fluorophenol (S)	%				75	77	55-125			
Nitrobenzene-d5 (S)	%				75	76	60-125			
p-Terphenyl-d14 (S)	%				97	101	58-125			
Phenol-d6 (S)	%				75	78	58-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 19505

Analysis Method: EPA 8315A

QC Batch Method: EPA 8315A

Analysis Description: 8315 GCSV Aldehydes

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 77391

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/06/18 15:23	

LABORATORY CONTROL SAMPLE: 77392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	455	114	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 77393

77394

Parameter	Units	10425440003		77394		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Formaldehyde	ug/L	ND	400	400	507	557	121	133	35-167	9	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

QC Batch: 531691 Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10425440001

METHOD BLANK: 2887411 Matrix: Water
Associated Lab Samples: 10425440001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/11/18 08:33	

LABORATORY CONTROL SAMPLE: 2887412

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	31.3	78	78-114	

MATRIX SPIKE SAMPLE: 2887413

Parameter	Units	10426156002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	41.2	36.5	85	78-114	

SAMPLE DUPLICATE: 2887414

Parameter	Units	10426326004 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	35.4	32.3	9	18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 438356	Analysis Method: SM 4500-CIO2
QC Batch Method: SM 4500-CIO2	Analysis Description: 4500CIO2 Chlorine Dioxide
Associated Lab Samples: 10425440003, 10425440004	

METHOD BLANK: 2380118 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/06/18 13:42	H6

LABORATORY CONTROL SAMPLE: 2380119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	94	90-110	H6

SAMPLE DUPLICATE: 2380120

Parameter	Units	10424606001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.25	0.25	0	20	H6

SAMPLE DUPLICATE: 2380121

Parameter	Units	7584977001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	0.95	0.96	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 531969

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2888915

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/12/18 10:51	FS

LABORATORY CONTROL SAMPLE: 2888916

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.3	90	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2888917 2888918

Parameter	Units	10426987002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	5.2	12.5	12.5	15.5	15.4	83	82	90-110	1	20	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 438646 Analysis Method: EPA 300.1
 QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
 Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2381795 Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/08/18 13:22	

LABORATORY CONTROL SAMPLE: 2381796

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	38.1	95	85-115	

MATRIX SPIKE SAMPLE: 2381798

Parameter	Units	7046923001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	<50.0		199			

SAMPLE DUPLICATE: 2381797

Parameter	Units	7046923001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	<50.0	ND			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 438647

Analysis Method: EPA 300.1

QC Batch Method: EPA 300.1

Analysis Description: 300.1 Oxihalides IC Anions

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 2381799

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/08/18 13:22	

LABORATORY CONTROL SAMPLE: 2381800

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	7.4	92	85-115	

MATRIX SPIKE SAMPLE: 2381802

Parameter	Units	7047470003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	<10.0	80	53.3	67	75-125	M6

SAMPLE DUPLICATE: 2381801

Parameter	Units	7047470003 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	<10.0	ND		20	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Sample: FD-SB-D5		Lab ID: 10425440003	Collected: 03/29/18 13:00	Received: 03/29/18 16:26	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	0.046 ± 2.17 (4.42) C:NA T:NA	pCi/L	04/11/18 19:18	12587-46-1	
Gross Beta	EPA 900.0	48.2 ± 9.69 (5.36) C:NA T:NA	pCi/L	04/11/18 19:18	12587-47-2	
Radium-226	EPA 903.1	0.703 ± 0.520 (0.703) C:NA T:90%	pCi/L	04/17/18 20:03	13982-63-3	
Radium-228	EPA 904.0	0.294 ± 0.378 (0.804) C:76% T:79%	pCi/L	04/13/18 11:50	15262-20-1	
Total Radium	Total Radium Calculation	0.997 ± 0.898 (1.51)	pCi/L	04/23/18 13:05	7440-14-4	

Sample: Field Replicate 1		Lab ID: 10425440004	Collected: 03/29/18 00:00	Received: 03/29/18 16:26	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	2.33 ± 1.72 (2.72) C:NA T:NA	pCi/L	04/10/18 18:53	12587-46-1	
Gross Beta	EPA 900.0	57.2 ± 10.7 (2.64) C:NA T:NA	pCi/L	04/10/18 18:53	12587-47-2	
Radium-226	EPA 903.1	1.25 ± 0.785 (1.04) C:NA T:84%	pCi/L	04/17/18 20:03	13982-63-3	
Radium-228	EPA 904.0	0.249 ± 0.375 (0.810) C:77% T:75%	pCi/L	04/13/18 11:50	15262-20-1	
Total Radium	Total Radium Calculation	1.50 ± 1.16 (1.85)	pCi/L	04/23/18 13:05	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 293694

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 1437839

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.285 (0.640) C:NA T:90%	pCi/L	04/17/18 20:03	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 293692

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10425440004

METHOD BLANK: 1437819

Matrix: Water

Associated Lab Samples: 10425440004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.067 ± 0.426 (1.07) C:NA T:NA	pCi/L	04/11/18 08:34	
Gross Beta	-0.252 ± 0.489 (1.38) C:NA T:NA	pCi/L	04/11/18 08:34	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch: 293578

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10425440003, 10425440004

METHOD BLANK: 1437152

Matrix: Water

Associated Lab Samples: 10425440003, 10425440004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.278 ± 0.394 (0.845) C:79% T:78%	pCi/L	04/13/18 11:48	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

QC Batch:	294292	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10425440003		

METHOD BLANK:	1440957	Matrix:	Water
Associated Lab Samples:	10425440003		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.020 ± 0.242 (0.682) C:NA T:NA	pCi/L	04/11/18 19:13	
Gross Beta	0.216 ± 0.533 (1.19) C:NA T:NA	pCi/L	04/11/18 19:13	

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

BATCH QUALIFIERS

Batch: 530640

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 530842

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 531691

[BE] Batch extracted by solid phase extraction (SPE).

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QUALIFIERS

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

ANALYTE QUALIFIERS

1M	Sample pH adjusted using 9mL 6N HCl.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
FS	The sample was filtered in the laboratory prior to analysis.
H2	Extraction or preparation conducted outside EPA method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S3	Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Water

Pace Project No.: 10425440

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425440003	FD-SB-D5	EPA 531.1	438337		
10425440003	FD-SB-D5	EPA 531.1	438883		
10425440004	Field Replicate 1	EPA 531.1	438337		
10425440003	FD-SB-D5	EPA 547	437576		
10425440004	Field Replicate 1	EPA 547	437576		
10425440003	FD-SB-D5	EPA 549.2	437867	EPA 549.2	438016
10425440004	Field Replicate 1	EPA 549.2	437867	EPA 549.2	438016
10425440003	FD-SB-D5	EPA 8011	530540	EPA 8011	530842
10425440004	Field Replicate 1	EPA 8011	530540	EPA 8011	530842
10425440003	FD-SB-D5	EPA 8015 Alcohol-Glycol	435508		
10425440004	Field Replicate 1	EPA 8015 Alcohol-Glycol	435508		
10425440003	FD-SB-D5	EPA 8015 Alcohol-Glycol	435360		
10425440004	Field Replicate 1	EPA 8015 Alcohol-Glycol	435360		
10425440001	FD-SB-A3	EPA Mod. 3510C	530316	EPA 8081B	530930
10425440001	FD-SB-A3	EPA Mod. 3510C	530321	EPA 8082A	530640
10425440003	FD-SB-D5	EPA 8315A	19505	EPA 8315A	19640
10425440004	Field Replicate 1	EPA 8315A	19505	EPA 8315A	19640
10425440003	FD-SB-D5	EPA 8316	19422		
10425440004	Field Replicate 1	EPA 8316	19422		
10425440003	FD-SB-D5	EPA 548.1	437555	EPA 548.1	438087
10425440004	Field Replicate 1	EPA 548.1	437555	EPA 548.1	438087
10425440001	FD-SB-A3	EPA 3520	530573	EPA 8270D	531095
10425440002	FD-SB-B4	EPA 3520	530573	EPA 8270D	531095
10425440003	FD-SB-D5	EPA 524.2	531079		
10425440004	Field Replicate 1	EPA 524.2	531079		
10425440003	FD-SB-D5	EPA 900.0	294292		
10425440004	Field Replicate 1	EPA 900.0	293692		
10425440003	FD-SB-D5	EPA 903.1	293694		
10425440004	Field Replicate 1	EPA 903.1	293694		
10425440003	FD-SB-D5	EPA 904.0	293578		
10425440004	Field Replicate 1	EPA 904.0	293578		
10425440003	FD-SB-D5	Total Radium Calculation	295609		
10425440004	Field Replicate 1	Total Radium Calculation	295609		
10425440001	FD-SB-A3	EPA 1664A OG	531691		
10425440003	FD-SB-D5	SM 4500-CIO2	438356		
10425440004	Field Replicate 1	SM 4500-CIO2	438356		
10425440003	FD-SB-D5	EPA 300.0	531969		
10425440004	Field Replicate 1	EPA 300.0	531969		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA FreewayLF Water
Pace Project No.: 10425440

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10425440003	FD-SB-D5	EPA 300.1	438646		
10425440004	Field Replicate 1	EPA 300.1	438646		
10425440003	FD-SB-D5	EPA 300.1	438647		
10425440004	Field Replicate 1	EPA 300.1	438647		

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WO#: 10425440



10425440

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Work Order Number:

COC Type:

Page: 1 of

Turnaround Time:

COC ID:

FOR LAB USE ONLY

LABORATORY

Facility Code:	MPCA Freeway LF Waters	Program Code (MDH Lab Only):	Lab Name:
Project Name:	MPCA Freeway LF Waters	Project Task Code:	Address: 18-00383
Project Manager:			EPIC Profile # 38716
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	Lab Sample No.	#
FD-SB-A3	S	3/29/18	1230			G	NW	WTT G FOUND			7			001	1
FD-SB-B4	S	3/29/18	1340			G	NW	WTT G FOUND			2			002	2
FD-SB-D5	S	3/29/18	1300			G	NW	WTT G FOUND			25			003	3
Field Replicate	QC-FR	3/29/18				G	NW	WTT G FOUND			25			004	4
															5
															6
															7
															8
															9
															10

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #:

Receiving Comments:	Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
	David Anderson / Pace Analytical	3/29/18/1626	W. Pace	3-29-18 1626

① collected from FD-SB-A3 = (6) GL, (1) GL HEI 6.9, 7.1, 6.8, 8.2 °C
 ② collected from FD-SB-B4 = (2) GL

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigaiton Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury - Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness detrmination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Sample Condition Upon Receipt

Client Name: MPCA - Field

Project #: _____

WO#: 10425440

PM: BM2

Due Date: 04/12/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No

Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____

Temp Blank? Yes No

Thermometer 151401163

Used: G87A9155100842

Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.7/6.9/6.6/6.0

Cooler Temp Corrected (°C): 6.5/7.0/6.2

Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C

Correction Factor: +0.2

Date and Initials of Person Examining Contents: 3/29/18 JD

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	10. Field Replicate (AG) cap broken & replaced
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. 1st 2 samples not labeled. Came in individual coolers w/sample ID
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>3-4 3/3</u>
Exceptions VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Ben W

Date: 4/2/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).


Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425440 Workorder Name: 18-00383 MPCA FreewayLF Water Owner Received Date: 3/29/2018 Results Requested By: 4/12/2018

Report To		Subcontract To						Requested Analysis																		
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600						<div style="text-align: right; font-size: 24pt; font-weight: bold;">WO#: 30248103</div>  <div style="text-align: right; font-weight: bold;">30248103</div>																		
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY											
1	FD-SB-D5	PS	3/29/2018 13:00	10425440003	Water	3					X	X	X	X												
2	Field Replicate 1	PS	3/29/2018 00:00	10425440004	Water	3					X	X	X	X												
3																										
4																										
5																										
Transfers	Released By	Date/Time	Received By	Date/Time	Comments																					
1	<i>[Signature]</i>	4/02/18 13:00	<i>[Signature]</i>	4/3/18 10:30																						
2																										
3																										
Cooler Temperature on Receipt		N/A °C	Custody Seal		Y or <u>N</u>	Received on Ice		Y or <u>N</u>	Samples Intact					Y or <u>N</u>												

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Face An

Project # 30248103

Courier: Fed Ex UPS USPS Client Commercial Pace Other

Tracking #: 747598319864

Label	<u>DS</u>
LIMS Login	<u>ZH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>ZH 4/3/18</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>DH 2</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ZH</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ZH</u> Date: <u>4/3/18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425440 Workorder Name: 18-00383 MPCA FreewayLF Water Owner Received Date: 3/29/2018 Results Requested By: 4/12/2018

Report To		Subcontract To		Requested Analysis																																								
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668																																										
				<table border="1"> <tr> <th colspan="2">Preserved Containers</th> <th>Aldicarb/Carbofuran EPA 8318</th> <th>Bromate/Chlorite EPA 300.1</th> <th>Chlorine Dioxide SM4500ClO2</th> <th>Diquat EPA 549.2</th> <th>Endothall EPA 548.1</th> <th>Glyphosate EPA 547</th> <th>Haloacetic acids, total (HAA5) EPA</th> <th colspan="4"></th> <th>LAB USE ONLY</th> </tr> <tr> <th>Other</th> <th>Unpreserved</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </table>												Preserved Containers		Aldicarb/Carbofuran EPA 8318	Bromate/Chlorite EPA 300.1	Chlorine Dioxide SM4500ClO2	Diquat EPA 549.2	Endothall EPA 548.1	Glyphosate EPA 547	Haloacetic acids, total (HAA5) EPA					LAB USE ONLY	Other	Unpreserved													
Preserved Containers		Aldicarb/Carbofuran EPA 8318	Bromate/Chlorite EPA 300.1	Chlorine Dioxide SM4500ClO2	Diquat EPA 549.2	Endothall EPA 548.1	Glyphosate EPA 547	Haloacetic acids, total (HAA5) EPA					LAB USE ONLY																															
Other	Unpreserved																																											
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	Unpreserved																																					
1	FD-SB-D5	PS	3/29/2018 13:00	10425440003	Water	2	3						X	X	X	X	X	X																										
2	Field Replicate 1	PS	3/29/2018 00:00	10425440004	Water	3	3						X	X	X	X	X	X																										
3																																												
4																																												
5																																												

Transfers					Comments											
Released By	Date/Time	Received By	Date/Time													
<i>[Signature]</i>	03/29/18 17:30	<i>[Signature]</i>	4/3/18 11:00													

Cooler Temperature on Receipt 3.5 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.





Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #
Project Manager:
Client:

NO# : 35383367
PM: ADC **Due Date: 04/12/18**
CLIENT: PACMIN

Date and Initials of person:
Examining contents: KBI
Label: SPK
Deliver: KBI
pH: KBI

Thermometer Used: T337 Date: 4/3/18 Time: 1100 Initials: SS

State of Origin: _____

- | | |
|--|--|
| Cooler #1 Temp. °C <u>3.9</u> (Visual) <u>-0.4</u> (Correction Factor) <u>3.5</u> (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |
| Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) | <input type="checkbox"/> Samples on ice, cooling process has begun |

- Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
- Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9831 9875


- Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None
- Packing Material: Bubble Wrap Bubble Bags None Other _____
- Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments): 552.3 HAA5 container not received for sample #1, FD-SB-15

Sample Condition Upon Receipt	Client Name: <u>FSD (Pace FI)</u>	Project #: _____	WO#: 10425440
Courier:	<input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client		 10425440
<input type="checkbox"/> Commercial	<input type="checkbox"/> Pace <input type="checkbox"/> Speedee <input type="checkbox"/> Other: _____		
Tracking Number:	<u>4278 3969 6010</u>		

Custody Seal on Cooler/Box Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Seals Intact? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Optional: Proj. Due Date: _____ Proj. Name: _____
Packing Material: <input type="checkbox"/> Bubble Wrap <input type="checkbox"/> Bubble Bags <input checked="" type="checkbox"/> None <input type="checkbox"/> Other: _____	Temp Blank? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Thermometer <input type="checkbox"/> 151401163	Type of Ice: <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Blue <input type="checkbox"/> None <input type="checkbox"/> Dry <input type="checkbox"/> Melted	
Used: <input checked="" type="checkbox"/> G87A9155100842		
Cooler Temp Read (°C): <u>0.7</u>	Cooler Temp Corrected (°C): <u>0.9</u>	Biological Tissue Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Temp should be above freezing to 6°C	Correction Factor: <u>1.02</u>	Date and Initials of Person Examining Contents: <u>ME 4/12/18</u>
USDA Regulated Soil (<input checked="" type="checkbox"/> N/A, water sample)	Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? <input type="checkbox"/> Yes <input type="checkbox"/> No	Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.		

	COMMENTS:
Chain of Custody Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1. Return Sample 10425440-003, 004
Chain of Custody Filled Out? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2.
Chain of Custody Relinquished? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. No COC
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Colliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION	Field Data Required? <input type="checkbox"/> Yes <input type="checkbox"/> No
Person Contacted: _____	Date/Time: _____
Comments/Resolution: _____	

Project Manager Review: _____	Date: _____
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).	

Chain of Custody


 Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10425440 Workorder Name: 18-00383 MPCA FreewayLF Water Owner Received Date: 3/29/2018 Results Requested By: 4/12/2018

Report To		Subcontract To					Requested Analysis																								
Bob Michels Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6452		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					Ethylene glycol/Methyl alcohol/EPA																								
50193522																															
LAB USE ONLY																															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved		Preserved Containers																							
1	FD-SB-D5	PS	3/29/2018 13:00	10425440003	Water	2																									
2	Field Replicate 1	PS	3/29/2018 00:00	10425440004	Water	2																									
3																															
4																															
5																															
Comments																															
Transfers	Released By	Date/Time	Received By	Date/Time																											
1	<i>Wayne Ford</i>	<i>4/02/18 1620</i>	<i>fedex</i>	<i>4/2/18 1620</i>																											
2	<i>fedex</i>	<i>4/3/18 0830</i>	<i>Jason Hauff</i>	<i>4/3/18 0830</i>																											
3																															
Cooler Temperature on Receipt <i>19</i> °C		Custody Seal <input checked="" type="checkbox"/> or N			Received on Ice <input checked="" type="checkbox"/> or N			Samples Intact <input checked="" type="checkbox"/> or N																							

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50193520

Date/Time and Initials of person examining contents: JH 4/3/18 10:24

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9831 9794

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 48/1.9 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia?		X	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			X
Document any containers out of temp.						
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?:		X	Headspace Wisconsin Sulfide			X
Analysis:						
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608) Residual Chlorine Check (Total/Amenable/Free Cyanide)	Present	Absent	N/A
						X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):		X	
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		X	

Comments:

Sample Container Count

WO#: 50193522



CLIENT: Pace minn

COC PAGE ___ of ___

COC ID# _____

Project # 50193522

Bil

Matrix (Soil/Aqueous)

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	DG9U	pH <2	pH >9	pH >12	
1																			Z				Wt
2																			Z				Wt
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
VGUFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
VGWFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: <u>Pace - Minnesota</u>	Work Order #: <u>4610172</u>
Receipt Record Page/Line #: <u>23-2</u>	Project Chemist: _____ Sample #: _____

Recorded by (initials/date): <u>RS 3/31/18</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other: _____	Qty Received: <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> Other (# _____)	<input type="checkbox"/> Thermometer Used <input type="checkbox"/> See Additional Cooler Information Form
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Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time	
<u>Red</u>	<u>0910</u>							
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input type="checkbox"/> Loose Ice <input checked="" type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: Dispersed / Top / <u>Middle</u> / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Coolant Location: Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Coolant Location: Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Coolant Location: Dispersed / Top / Middle / Bottom Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C
Temp Blank:			Temp Blank:			Temp Blank:		
Sample 1:	<u>1.9</u>	<u>1.9</u>	Sample 1:			Sample 1:		
Sample 2:	<u>1.7</u>	<u>1.7</u>	Sample 2:			Sample 2:		
Sample 3:	<u>2.4</u>	<u>2.4</u>	Sample 3:			Sample 3:		
3 Sample Average °C: _____			3 Sample Average °C: _____			3 Sample Average °C: _____		
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes No

Chain of Custody record(s)? If No, Initiated By _____
 Received for Lab Signed/Date/Time?

Shipping document?

Other: _____

COC Information

Pace COC Other: _____

COC ID Numbers: _____

Check COC for Accuracy

Yes No

Analysis Requested?

Sample ID matches COC?

Sample Date and Time matches COC?

Container type completed on COC?

All container types indicated are received?

Sample Condition Summary

N/A Yes No

Broken containers/lids?

Missing or incomplete labels?

Illegible information on labels?

Low volume received?

Inappropriate or non-Pace containers received?

VOC vials / TOX containers have headspace?

Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6° C?

If either is ≥6° C, was thermal preservation required?
 If "Yes", Project Chemist Approval Initials: _____
 If "Yes" Completed Non Con Cooler - Cont Inventory Form?

Completed Sample Preservation Verification Form?

Samples chemically preserved correctly?
 If "No", added orange tag?

Received pre-preserved VOC soils?
 MeOH Na₂SO₄

Check for Short Hold-Time Prep/Analyses

Bacteriological

Air Bags

EnCores / Methanol Pre-Preserved

Formaldehyde/Aldehyde

Green-tagged containers

Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:
 COPIES OF COC TO LAB AREA(S)
 NONE RECEIVED
 RECEIVED, COCs TO LAB(S)

Notes

Trip Blank received Trip Blank not listed on COC

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
<u>RS 3/31/18</u>	<u>RS 3/31/18</u>	<u>Yes / No</u>



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 12, 2018

Bob Michels
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/03/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10425440 Project Manager: Bob Michels
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-SB-D5 (10425440003)	A181406-01	Water	03/29/2018	04/03/2018
Field Replicate 1 (10425440004)	A181406-02	Water	03/29/2018	04/03/2018

CASE NARRATIVE

Sample Receipt Information:

2 samples were received on 04/03/2018. Samples were received at 2.3 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LCS recovery indicates a potential high bias for 2,4,5-TP, 2,4-D, 2,4-DB, bentazon, dicamba, MCPA and triclopyr for samples A181406-01 and A181406-02. Samples were less than the reporting limit for these analytes so no further action is required.



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Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425440
Project Manager: Bob Michels

FD-SB-D5 (10425440003)

Date Sampled

A181406-01 (Water)

03/29/2018 13:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804115

Acetochlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:03	EPA 8270D	

Surrogate: Atrazine-d5		105 %		65.1-122	04/05/2018	04/09/2018 10:03	EPA 8270D	
Surrogate: Parathion-d10		120 %		22.3-159	04/05/2018	04/09/2018 10:03	EPA 8270D	
Surrogate: Triphenyl phosphate		153 %		65.2-151	04/05/2018	04/09/2018 10:03	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804111

2,4-D	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/04/2018	04/07/2018 06:32	EPA 8151A	

Surrogate: 2,4-D-d5		139 %		44.2-121	04/04/2018	04/07/2018 06:32	EPA 8151A	S
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Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425440
Project Manager: Bob Michels

Field Replicate 1 (10425440004)

A181406-02 (Water)

Date Sampled
03/29/2018 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804115

Acetochlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/05/2018	04/09/2018 10:31	EPA 8270D	
Surrogate: Atrazine-d5		101 %		65.1-122	04/05/2018	04/09/2018 10:31	EPA 8270D	
Surrogate: Parathion-d10		113 %		22.3-159	04/05/2018	04/09/2018 10:31	EPA 8270D	
Surrogate: Triphenyl phosphate		177 %		65.2-151	04/05/2018	04/09/2018 10:31	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804111

2,4-D	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/04/2018	04/07/2018 07:07	EPA 8151A	
Surrogate: 2,4-D-d5		124 %		44.2-121	04/04/2018	04/07/2018 07:07	EPA 8151A	S



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
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Pace Analytical
 1700 Elm Street, Suite 202
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425440
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804115 - EPA 3510C

Blank (A804115-BLK1)

Prepared: 04/05/2018 Analyzed: 04/09/2018 10:59

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>80.7</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.4</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.510</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>65.2-151</i>			

LCS (A804115-BS1)

Prepared: 04/05/2018 Analyzed: 04/09/2018 11:54

Acetochlor	1.04	0.50	ug/L	1.000		104	67.5-120			
Alachlor	1.07	0.50	ug/L	1.000		107	71.7-120			
Atrazine	1.01	0.50	ug/L	1.000		101	72.8-113			
Chlorpyrifos	0.999	0.50	ug/L	1.000		99.9	65.3-119			
Cyanazine	1.07	0.20	ug/L	1.000		107	49.5-140			
Desethylatrazine	0.971	0.50	ug/L	1.000		97.1	66.9-116			
Deisopropylatrazine	0.786	0.50	ug/L	1.000		78.6	44.3-110			
Dimethenamid	1.05	0.50	ug/L	1.000		105	63.8-116			
EPTC	0.786	0.50	ug/L	1.000		78.6	41.7-102			
Ethalfuralin	0.771	0.50	ug/L	1.000		77.1	41-127			
Fonofos	0.868	0.50	ug/L	1.000		86.8	59.7-118			
Metolachlor	1.08	0.50	ug/L	1.000		108	71.7-122			
Metribuzin	1.04	0.50	ug/L	1.000		104	66.6-128			
Pendimethalin	1.00	0.50	ug/L	1.000		100	55.5-137			
Phorate	0.906	0.30	ug/L	1.000		90.6	41.2-114			
Prometon	1.04	0.50	ug/L	1.000		104	66.3-120			
Propachlor	1.01	0.50	ug/L	1.000		101	65.8-119			



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10425440
 Project Manager: Bob Michels

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804115 - EPA 3510C

LCS (A804115-BS1)

Prepared: 04/05/2018 Analyzed: 04/09/2018 11:54

Propazine	1.01	0.50	ug/L	1.000		101	72-122			
Simazine	1.00	0.50	ug/L	1.000		100	72.8-113			
Terbufos	0.853	0.20	ug/L	1.000		85.3	38.6-115			
Triallate	0.826	0.50	ug/L	1.000		82.6	51.4-116			
Trifluralin	0.841	0.50	ug/L	1.000		84.1	46.1-134			
Surrogate: Atrazine-d5	0.442		ug/L	0.5000		88.4	65.1-122			
Surrogate: Parathion-d10	0.488		ug/L	0.5000		97.6	22.3-159			
Surrogate: Triphenyl phosphate	0.489		ug/L	0.5000		97.9	65.2-151			

LCS Dup (A804115-BS1)

Prepared: 04/05/2018 Analyzed: 04/09/2018 12:22

Acetochlor	0.959	0.50	ug/L	1.000		95.9	67.5-120	7.72	20	
Alachlor	0.953	0.50	ug/L	1.000		95.3	71.7-120	11.3	20	
Atrazine	0.934	0.50	ug/L	1.000		93.4	72.8-113	8.18	20	
Chlorpyrifos	0.936	0.50	ug/L	1.000		93.6	65.3-119	6.50	20	
Cyanazine	1.03	0.20	ug/L	1.000		103	49.5-140	3.38	20	
Desethylatrazine	0.906	0.50	ug/L	1.000		90.6	66.9-116	6.91	20	
Deisopropylatrazine	0.746	0.50	ug/L	1.000		74.6	44.3-110	5.26	20	
Dimethenamid	0.953	0.50	ug/L	1.000		95.3	63.8-116	9.83	20	
EPTC	0.722	0.50	ug/L	1.000		72.2	41.7-102	8.53	20	
Ethalfluralin	0.721	0.50	ug/L	1.000		72.1	41-127	6.80	20	
Fonofos	0.821	0.50	ug/L	1.000		82.1	59.7-118	5.55	20	
Metolachlor	0.986	0.50	ug/L	1.000		98.6	71.7-122	9.13	20	
Metribuzin	0.940	0.50	ug/L	1.000		94.0	66.6-128	9.71	20	
Pendimethalin	0.935	0.50	ug/L	1.000		93.5	55.5-137	7.02	20	
Phorate	0.783	0.30	ug/L	1.000		78.3	41.2-114	14.5	20	
Prometon	0.949	0.50	ug/L	1.000		94.9	66.3-120	9.04	20	
Propachlor	0.916	0.50	ug/L	1.000		91.6	65.8-119	10.2	20	
Propazine	0.963	0.50	ug/L	1.000		96.3	72-122	4.75	20	
Simazine	0.937	0.50	ug/L	1.000		93.7	72.8-113	6.73	20	
Terbufos	0.778	0.20	ug/L	1.000		77.8	38.6-115	9.20	20	
Triallate	0.741	0.50	ug/L	1.000		74.1	51.4-116	10.9	20	
Trifluralin	0.725	0.50	ug/L	1.000		72.5	46.1-134	14.8	20	
Surrogate: Atrazine-d5	0.405		ug/L	0.5000		80.9	65.1-122			
Surrogate: Parathion-d10	0.423		ug/L	0.5000		84.6	22.3-159			
Surrogate: Triphenyl phosphate	0.464		ug/L	0.5000		92.8	65.2-151			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10425440
Project Manager: Bob Michels

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804111 - EPA 3510C

Blank (A804111-BLK1)

Prepared: 04/04/2018 Analyzed: 04/06/2018 22:20

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.31 ug/L 2.016 115 44.2-121

LCS (A804111-BS1)

Prepared: 04/04/2018 Analyzed: 04/07/2018 01:52

2,4-D	3.13	0.50	ug/L	2.000		157	64.6-148			
2,4-DB	2.91	0.50	ug/L	2.000		145	66.7-143			
2,4,5-T	2.59	0.50	ug/L	2.000		129	63.4-133			
2,4,5-TP (Silvex)	3.08	0.50	ug/L	2.000		154	63-145			
Bentazon	1.38	0.50	ug/L	1.000		138	52.5-139			
Dicamba	2.92	0.50	ug/L	2.000		146	55.4-143			
MCPA	3.00	0.30	ug/L	2.000		150	33.5-143			
Picloram	1.13	0.50	ug/L	1.000		113	47.9-113			
Triclopyr	2.89	0.50	ug/L	2.000		144	65.1-141			

Surrogate: 2,4-D-d5

2.32 ug/L 2.016 115 44.2-121

LCS Dup (A804111-BSD1)

Prepared: 04/04/2018 Analyzed: 04/07/2018 02:27

2,4-D	3.06	0.50	ug/L	2.000		153	64.6-148	2.15	20	
2,4-DB	2.77	0.50	ug/L	2.000		139	66.7-143	4.71	20	
2,4,5-T	2.67	0.50	ug/L	2.000		133	63.4-133	3.13	20	
2,4,5-TP (Silvex)	3.15	0.50	ug/L	2.000		158	63-145	2.45	20	
Bentazon	1.40	0.50	ug/L	1.000		140	52.5-139	1.22	20	
Dicamba	3.19	0.50	ug/L	2.000		159	55.4-143	8.83	20	
MCPA	3.11	0.30	ug/L	2.000		155	33.5-143	3.37	20	
Picloram	1.11	0.50	ug/L	1.000		111	47.9-113	2.12	20	
Triclopyr	3.03	0.50	ug/L	2.000		152	65.1-141	4.96	20	

Surrogate: 2,4-D-d5

2.26 ug/L 2.016 112 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10425440 Project Manager: Bob Michels
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Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

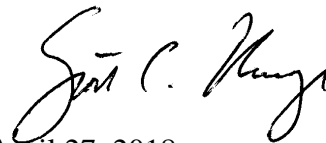
PaceProject#: 10427261
Sample Receipt Date: 04/13/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



April 27, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

April 27, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 72%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained. Concentrations below the calibration range were flagged "J" and should be regarded as estimates.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 112-113% with a relative percent difference of 0.9%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10427261

Appendix A

Sample Management

WO#: 10427261



Report No.....10427261_1613TCDD_BFR

		Chain-of-Custody Form		Work Order Number: 10427261		1 of 1								
PROJECT/CLIENT INFO				Turnaround Time:		FOR LAB USE ONLY								
Facility Code: MPCA-FreewayLF wateris		Program Code (MDH Lab Only):		Lab Name:		18-00383								
Project Name: MPCA-FreewayLF wateris		Project Task Code:		Address:		Epic Profile # 38716								
Project Manager:		If yes, add information to Sampler Comments Section		Phone No:		Lab Work Order Sticker								
SAMPLE TYPE CODES Sample=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample				LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		FIELD MATRIX CODES Wn-Ground=Groundwater Ws-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample								
QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TS=Trip Blank Sample				AR=Air BL=Biological Material OT=Other TS=Tissue		ANALYSIS REQUESTED								
Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
FD-SB	S					G	NW	WTS				List A		1
FD-TT-06	S	4/12/18	1230			G	NW	WTS			41		001	2
TS-SB-02	S	4/12/18	1930			G	NW	WTS			1			3
DTA 4/12/18														
Sampled By: David Anderson				Sampler's Signature: <i>David Anderson</i>				Phone #:						
Receiving Comments:														
Relinquished By/Affiliation DTA 4/12/18 David Anderson / Pace Analytical		Date/Time 4/12/18		Accepted By/Affiliation DTA David Anderson / Pace Analytical		Date/Time 4/13/18 0745		11/18 80		T=4.3 3.6				

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO#: 10427261
 PM: SCU Due Date: 04/27/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: PTB Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Dry Melted
 Used: G87A9155100842

Cooler Temp Read (°C): 4.1, 3.4 Cooler Temp Corrected (°C): 4.3, 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: RG 4/13/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: _____

Date: 04/13/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

*** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Dissolved-Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/16 email from Mark Umholtz (MPCA).
BGJ-Pace

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500ClO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (THMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427261

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-06		
Lab Sample ID	10427261001		
Filename	U180422B_14		
Injected By	BAL		
Total Amount Extracted	510 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/12/2018 12:30
ICAL ID	U180405	Received	04/13/2018 12:05
CCal Filename(s)	U180422A_16	Extracted	04/16/2018 14:55
Method Blank ID	BLANK-61751	Analyzed	04/23/2018 00:43

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	17	----	10 J	2,3,7,8-TCDD-13C	2.00	72
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	85

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

J = Estimated value
 R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61751	Matrix	Water
Filename	U180421A_06	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/16/2018 14:55
ICAL ID	U180405	Analyzed	04/21/2018 17:22
CCal Filename(s)	U180420B_15	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	63
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	73

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61752	Matrix	Water
Filename	U180421A_01	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	04/16/2018 14:55
ICAL ID	U180405	Analyzed	04/21/2018 13:22
CCal Filename	U180420B_15	Injected By	BAL
Method Blank ID	BLANK-61751		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	112
2,3,7,8-TCDD-37Cl4	10	8.8	3.7	15.8	88
2,3,7,8-TCDD-13C	100	74	25.0	141.0	74

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61753	Matrix	Water
Filename	U180421A_02	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	04/16/2018 14:55
ICAL ID	U180405	Analyzed	04/21/2018 14:09
CCal Filename	U180420B_15	Injected By	BAL
Method Blank ID	BLANK-61751		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	113
2,3,7,8-TCDD-37Cl4	10	9.1	3.7	15.8	91
2,3,7,8-TCDD-13C	100	74	25.0	141.0	74

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61752
Spike 1 Filename U180421A_01

Spike 2 ID LCSD-61753
Spike 2 Filename U180421A_02

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	112	113	0.9

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 10, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Alaska Certification UST-107
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #57971 and 57972
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427276001	FD-TT-06	Water	04/12/18 12:30	04/13/18 08:00
10427276002	TS-SB-02	Water	04/12/18 19:30	04/13/18 08:00

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427276001	FD-TT-06	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	38	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	AR3	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	AR3	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O
SM 3500-Cr B Modified	JFP	1	PASI-M		
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
10427276002	TS-SB-02	EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 245.1	LMW	1	PASI-M

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Project No.: 10427276

Sample: FD-TT-06		Lab ID: 10427276001		Collected: 04/12/18 12:30		Received: 04/13/18 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
Field Data									
Analytical Method:									
Field pH	6.7	Std. Units	0.10	1		04/12/18 12:30			
Field Temperature	6.5	deg C	0.50	1		04/12/18 12:30			
531.1 HPLC Carbamates									
Analytical Method: EPA 531.1									
Aldicarb	ND	ug/L	2.0	1		05/04/18 07:38	116-06-3		
Carbofuran	ND	ug/L	2.0	1		05/04/18 07:38	1563-66-2		
Surrogates									
BDMC (S)	109	%	80-120	1		05/04/18 07:38			
547 HPLC Glyphosate									
Analytical Method: EPA 547									
Glyphosate	ND	ug/L	6.0	1		04/27/18 02:05			
549.2 HPLC Paraquat Diquat									
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2									
Diquat	ND	ug/L	0.40	1	04/18/18 23:22	04/19/18 19:40	85-00-7		
Paraquat	ND	ug/L	0.40	1	04/18/18 23:22	04/19/18 19:40	1910-42-5		
552.3 Haloacetic Acids									
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3									
Dibromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	631-64-1		
Dichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	79-43-6		
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51			
Monobromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	79-08-3		
Monochloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	79-11-8		
Trichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 18:51	76-03-9		
Surrogates									
2,3-Dibromopropanoic Acid (S)	128	%	70-130	1	04/21/18 00:13	04/25/18 18:51	600-05-5		
8011 GCS EDB and DBCP									
Analytical Method: EPA 8011 Preparation Method: EPA 8011									
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/24/18 14:16	04/24/18 23:22	96-12-8		
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/24/18 14:16	04/24/18 23:22	106-93-4		
Surrogates									
4-Bromofluorobenzene (S)	113	%.	30-150	1	04/24/18 14:16	04/24/18 23:22	460-00-4		
8015M Alcohols in water									
Analytical Method: EPA 8015 Alcohol-Glycol									
Methanol	ND	ug/L	5000	1		04/25/18 15:40	67-56-1		
8015M Glycols in water									
Analytical Method: EPA 8015 Alcohol-Glycol									
Ethylene glycol	ND	mg/L	5.0	1		04/23/18 15:44	107-21-1		
8081B GCS Pesticides									
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C									
Aldrin	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	309-00-2		
alpha-BHC	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	319-84-6		
beta-BHC	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	319-85-7		
delta-BHC	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	319-86-8		
gamma-BHC (Lindane)	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	58-89-9		
Chlordane (Technical)	ND	ug/L	1.0	2	04/13/18 17:03	04/17/18 00:01	57-74-9		
alpha-Chlordane	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	5103-71-9		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06	Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
gamma-Chlordane	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	5103-74-2	
4,4'-DDD	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	72-54-8	
4,4'-DDE	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	72-55-9	
4,4'-DDT	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	50-29-3	
Dieldrin	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	60-57-1	
Endosulfan I	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	959-98-8	
Endosulfan II	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	1031-07-8	
Endrin	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	72-20-8	
Endrin aldehyde	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	7421-93-4	
Endrin ketone	ND	ug/L	0.21	2	04/13/18 17:03	04/17/18 00:01	53494-70-5	
Heptachlor	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	76-44-8	
Heptachlor epoxide	ND	ug/L	0.10	2	04/13/18 17:03	04/17/18 00:01	1024-57-3	
Methoxychlor	ND	ug/L	1.0	2	04/13/18 17:03	04/17/18 00:01	72-43-5	
Toxaphene	ND	ug/L	3.1	2	04/13/18 17:03	04/17/18 00:01	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	87	%	62-125	2	04/13/18 17:03	04/17/18 00:01	877-09-8	1M,D3
Decachlorobiphenyl (S)	52	%	30-143	2	04/13/18 17:03	04/17/18 00:01	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/13/18 17:03	04/16/18 16:15	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	76	%	30-125	1	04/13/18 17:03	04/16/18 16:15	877-09-8	
Decachlorobiphenyl (S)	51	%	30-125	1	04/13/18 17:03	04/16/18 16:15	2051-24-3	
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/19/18 09:11	04/19/18 16:07	50-00-0	H3,R1
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/18/18 17:33	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	1610	ug/L	200	1	04/17/18 11:11	04/19/18 17:00	7429-90-5	
Barium, Dissolved	407	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:00	7440-39-3	
Copper, Dissolved	54.1	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:00	7440-50-8	
Manganese, Dissolved	738	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:00	7439-96-5	
Nickel, Dissolved	27.4	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:00	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:00	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06		Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:00	7440-31-5	
Zinc, Dissolved	212	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:00	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	14.6	ug/L	0.50	1	04/16/18 11:40	04/16/18 20:38	7440-47-3	
Total Hardness by 2340B	477000	ug/L	2820	20	04/16/18 11:40	04/16/18 20:41		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	1.3	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-36-0	
Arsenic, Dissolved	2.4	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-38-2	
Beryllium, Dissolved	0.21	ug/L	0.20	1	04/16/18 06:50	04/18/18 16:44	7440-41-7	
Boron, Dissolved	6600	ug/L	500	100	04/16/18 06:50	04/18/18 15:09	7440-42-8	
Cadmium, Dissolved	0.65	ug/L	0.080	1	04/16/18 06:50	04/18/18 16:44	7440-43-9	
Chromium, Dissolved	3.9	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-47-3	
Cobalt, Dissolved	4.6	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-48-4	
Lead, Dissolved	21.5	ug/L	0.10	1	04/16/18 06:50	04/18/18 16:44	7439-92-1	
Selenium, Dissolved	2.6	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7782-49-2	
Thallium, Dissolved	0.61	ug/L	0.10	1	04/16/18 06:50	04/18/18 16:44	7440-28-0	
Uranium-238, Dissolved	2.0	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:44	7440-61-1	
Vanadium, Dissolved	4.4	ug/L	1.0	1	04/16/18 06:50	04/18/18 16:44	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	0.26	ug/L	0.20	1	04/16/18 14:31	04/16/18 14:41	7439-97-6	
548.1 GCS Endothall		Analytical Method: EPA 548.1 Preparation Method: EPA 548.1						
Endothall	ND	ug/L	9.0	1	04/19/18 08:10	04/19/18 22:45		IO
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	83-32-9	
Anthracene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	50-32-8	
Benzoic acid	ND	ug/L	51.8	1	04/16/18 17:28	04/20/18 17:44	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.8	1	04/16/18 17:28	04/20/18 17:44	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	84-66-2	
2,4-Dimethylphenol	ND	ug/L	51.8	1	04/16/18 17:28	04/20/18 17:44	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	206-44-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06	Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Fluorene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.8	1	04/16/18 17:28	04/20/18 17:44	77-47-4	
Hexachloroethane	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	67-72-1	
Isophorone	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.7	1	04/16/18 17:28	04/20/18 17:44		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	86-30-6	
Pentachlorophenol	ND	ug/L	20.7	1	04/16/18 17:28	04/20/18 17:44	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	85-01-8	
Phenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	108-95-2	
Pyrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 17:44	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	70	%	60-125	1	04/16/18 17:28	04/20/18 17:44	4165-60-0	
2-Fluorobiphenyl (S)	79	%	56-125	1	04/16/18 17:28	04/20/18 17:44	321-60-8	
p-Terphenyl-d14 (S)	84	%	58-125	1	04/16/18 17:28	04/20/18 17:44	1718-51-0	
Phenol-d6 (S)	73	%	58-125	1	04/16/18 17:28	04/20/18 17:44	13127-88-3	
2-Fluorophenol (S)	68	%	55-125	1	04/16/18 17:28	04/20/18 17:44	367-12-4	
2,4,6-Tribromophenol (S)	96	%	65-125	1	04/16/18 17:28	04/20/18 17:44	118-79-6	
524.2 MSV Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/17/18 14:07		
Surrogates								
4-Bromofluorobenzene (S)	96	%	75-125	1		04/17/18 14:07	460-00-4	
Toluene-d8 (S)	96	%	75-125	1		04/17/18 14:07	2037-26-5	
1,2-Dichloroethane-d4 (S)	103	%	75-125	1		04/17/18 14:07	17060-07-0	
Field Data Analytical Method:								
Field pH	6.7	Std. Units		1		04/12/18 12:30		
Field Temperature	6.5	deg C		1		04/12/18 12:30		
Hach 10360 Rev 1.1 BOD Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	27.7	mg/L	20.0	10	04/13/18 14:56	04/18/18 16:35		
1664 HEM, Oil and Grease Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.8	1		04/25/18 12:19		
180.1 Turbidity Analytical Method: EPA 180.1								
Turbidity	315	NTU	7.5	25		04/13/18 15:04		
2540D Total Suspended Solids Analytical Method: SM 2540D								
Total Suspended Solids	230	mg/L	10.0	1		04/18/18 14:24		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06	Lab ID: 10427276001	Collected: 04/12/18 12:30	Received: 04/13/18 08:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500ClO2 Chlorine Dioxide	Analytical Method: SM 4500-ClO2							
Chlorine Dioxide	1.6	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.8	Std. Units	0.10	1		04/24/18 14:42		H6
Trivalent Chromium Calculation	Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	ND	mg/L	0.010	1		04/24/18 15:01		
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	56.5	mg/L	1.2	1		04/17/18 17:22	16887-00-6	M1
Fluoride	0.14	mg/L	0.050	1		04/17/18 17:22	16984-48-8	M1
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	50.0	10		04/22/18 16:38		D3
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/22/18 16:38	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	0.011	mg/L	0.010	1		04/13/18 16:43		FS,H1, M1
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:46		
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)							
Nitrogen, Ammonia	5.4	mg/L	0.10	1	04/19/18 15:00	04/20/18 07:09	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	0.55	mg/L	0.020	1		04/13/18 16:58	14797-55-8	FS
Nitrite as N	0.032	mg/L	0.020	1		04/13/18 16:58	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.58	mg/L	0.020	1		04/13/18 16:58		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/24/18 16:40	04/24/18 17:42		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	ND	ug/L	10.0	1	04/23/18 09:55	04/23/18 12:31	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.19	mg/L	0.050	1	04/17/18 09:29	04/17/18 13:38	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: TS-SB-02		Lab ID: 10427276002	Collected: 04/12/18 19:30	Received: 04/13/18 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/17/18 11:11	04/19/18 17:03	7429-90-5	
Barium, Dissolved	796	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:03	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:03	7440-50-8	
Manganese, Dissolved	722	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:03	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:03	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:03	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:03	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:03	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	1.5	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-36-0	
Arsenic, Dissolved	3.1	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/16/18 06:50	04/18/18 16:49	7440-41-7	
Boron, Dissolved	582	ug/L	500	100	04/16/18 06:50	04/18/18 15:13	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/16/18 06:50	04/18/18 16:49	7440-43-9	
Chromium, Dissolved	1.1	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-47-3	
Cobalt, Dissolved	2.3	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-48-4	
Lead, Dissolved	0.36	ug/L	0.10	1	04/16/18 06:50	04/18/18 16:49	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/16/18 06:50	04/18/18 16:49	7440-28-0	
Uranium-238, Dissolved	0.85	ug/L	0.50	1	04/16/18 06:50	04/18/18 16:49	7440-61-1	
Vanadium, Dissolved	1.3	ug/L	1.0	1	04/16/18 06:50	04/18/18 16:49	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	04/16/18 14:31	04/16/18 14:43	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch:	444328	Analysis Method:	EPA 531.1
QC Batch Method:	EPA 531.1	Analysis Description:	531.1 HPLC Carbamate
Associated Lab Samples:	10427276001		

METHOD BLANK: 2409903 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/03/18 15:06	
Carbofuran	ug/L	ND	2.0	05/03/18 15:06	
BDMC (S)	%	103	80-120	05/03/18 15:06	

LABORATORY CONTROL SAMPLE: 2409904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	10.4	104	80-120	
Carbofuran	ug/L	10	8.8	88	80-120	
BDMC (S)	%			94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409905 2409906

Parameter	Units	35385680001 Result	MS Spike Conc.	MSD Spike Conc.	2409905		2409906		% Rec Limits	Max		Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec		RPD	RPD	
Aldicarb	ug/L	0.64U	10	10	7.9	9.3	79	93	80-120	16	20	M1
Carbofuran	ug/L	0.32U	10	10	7.7	8.7	77	87	80-120	12	20	M1
BDMC (S)	%						47	94	80-120			S0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 441208 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10427276001

METHOD BLANK: 2394537 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/26/18 20:22	

LABORATORY CONTROL SAMPLE: 2394538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	50.3	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394539 2394540

Parameter	Units	92380797002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	51.6	48.4	103	97	80-120	7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394541 2394542

Parameter	Units	35385315001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<4.2	50	50	52.2	52.2	104	104	80-120	0	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10427276001

METHOD BLANK: 2027992 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	ug/L	ND	5000	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	ug/L	50000	46800	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Methanol	ug/L	ND	50000	50000	47100	51900	91	101	43-138	10	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 438205 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427276001

METHOD BLANK: 2024704 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/23/18 14:09	

LABORATORY CONTROL SAMPLE: 2024705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	29.3	117	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026734 2026735

Parameter	Units	50194690001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Ethylene glycol	mg/L	ND	25	25	21.9	24.7	87	99	38-154	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 20643	Analysis Method: EPA 8316
QC Batch Method: EPA 8316	Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10427276001	

METHOD BLANK: 82388 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/18/18 17:05	

LABORATORY CONTROL SAMPLE: 82389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	989	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 82390 82391

Parameter	Units	10427276001		82391		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Acrylamide	ug/L	ND	1000	1000	944	963	94	96	78-135	2 16

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 532450

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury - Dissolved

Associated Lab Samples: 10427276001, 10427276002

METHOD BLANK: 2891722

Matrix: Water

Associated Lab Samples: 10427276001, 10427276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/16/18 14:29	

LABORATORY CONTROL SAMPLE: 2891723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891724 2891725

Parameter	Units	10426205002		2891724		2891725		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury, Dissolved	ug/L	<0.062	5	5	5	5.3	5.1	107	103	70-130	4	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532437 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10427276001, 10427276002

METHOD BLANK: 2891672 Matrix: Water
Associated Lab Samples: 10427276001, 10427276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/19/18 16:13	
Barium, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Copper, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Manganese, Dissolved	ug/L	ND	5.0	04/19/18 16:13	
Nickel, Dissolved	ug/L	ND	20.0	04/19/18 16:13	
Silver, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Tin, Dissolved	ug/L	ND	75.0	04/19/18 16:13	
Zinc, Dissolved	ug/L	ND	20.0	04/19/18 16:13	

LABORATORY CONTROL SAMPLE: 2891673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21400	107	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	1020	102	85-115	
Manganese, Dissolved	ug/L	1000	1040	104	85-115	
Nickel, Dissolved	ug/L	1000	1030	103	85-115	
Silver, Dissolved	ug/L	500	506	101	85-115	
Tin, Dissolved	ug/L	1000	1020	102	85-115	
Zinc, Dissolved	ug/L	1000	1040	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891674 2891675

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	10427032001 Result	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21600	21800	108	109	70-130	1	30
Barium, Dissolved	ug/L	ND	1000	1000	1010	1020	100	101	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1050	1050	105	105	70-130	1	30
Manganese, Dissolved	ug/L	8.5	1000	1000	1010	1020	100	101	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	993	997	99	100	70-130	0	30
Silver, Dissolved	ug/L	ND	500	500	506	508	101	102	70-130	0	30
Tin, Dissolved	ug/L	ND	1000	1000	1030	1020	103	101	70-130	1	30
Zinc, Dissolved	ug/L	ND	1000	1000	1030	1030	102	102	70-130	0	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

MATRIX SPIKE SAMPLE: 2893024		10427135002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	ND	20000	23000	115	70-130	
Barium, Dissolved	ug/L	22.2	1000	1080	106	70-130	
Copper, Dissolved	ug/L	ND	1000	1080	108	70-130	
Manganese, Dissolved	ug/L	118	1000	1170	105	70-130	
Nickel, Dissolved	ug/L	ND	1000	1010	100	70-130	
Silver, Dissolved	ug/L	ND	500	532	106	70-130	
Tin, Dissolved	ug/L	ND	1000	1030	103	70-130	
Zinc, Dissolved	ug/L	ND	1000	1010	100	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532432 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10427276001

METHOD BLANK: 2891650 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/16/18 20:02	

LABORATORY CONTROL SAMPLE: 2891651

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	96.9	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891652 2891653

Parameter	Units	10427358001		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chromium	ug/L	ND	100	100	100	100	102	100	102	70-130	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532434 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10427276001, 10427276002

METHOD BLANK: 2891658 Matrix: Water
Associated Lab Samples: 10427276001, 10427276002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Arsenic, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Beryllium, Dissolved	ug/L	ND	0.20	04/18/18 00:27	
Boron, Dissolved	ug/L	ND	5.0	04/18/18 00:27	
Cadmium, Dissolved	ug/L	ND	0.080	04/18/18 00:27	
Chromium, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Cobalt, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Lead, Dissolved	ug/L	ND	0.10	04/18/18 00:27	
Selenium, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Thallium, Dissolved	ug/L	ND	0.10	04/18/18 14:59	
Uranium-238, Dissolved	ug/L	ND	0.50	04/18/18 00:27	
Vanadium, Dissolved	ug/L	ND	1.0	04/18/18 00:27	

LABORATORY CONTROL SAMPLE: 2891659

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	110	110	85-115	
Arsenic, Dissolved	ug/L	100	110	110	85-115	
Beryllium, Dissolved	ug/L	100	110	110	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	110	110	85-115	
Chromium, Dissolved	ug/L	100	111	111	85-115	
Cobalt, Dissolved	ug/L	100	108	108	85-115	
Lead, Dissolved	ug/L	100	108	108	85-115	
Selenium, Dissolved	ug/L	100	114	114	85-115	
Thallium, Dissolved	ug/L	100	106	106	85-115	
Uranium-238, Dissolved	ug/L	100	108	108	85-115	
Vanadium, Dissolved	ug/L	100	111	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891660 2891661

Parameter	Units	10427168001		2891661		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result						
Antimony, Dissolved	ug/L	ND	100	100	110	109	109	70-130	0	20	
Arsenic, Dissolved	ug/L	1.7	100	100	112	117	110	70-130	4	20	
Beryllium, Dissolved	ug/L	ND	100	100	102	105	102	70-130	3	20	
Boron, Dissolved	ug/L	27.0	100	100	124	124	97	70-130	0	20	
Cadmium, Dissolved	ug/L	0.38	100	100	104	107	104	70-130	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891660												2891661	
Parameter	Units	10427168001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Chromium, Dissolved	ug/L	ND	100	100	108	112	108	111	70-130	3	20		
Cobalt, Dissolved	ug/L	11.1	100	100	118	122	107	111	70-130	3	20		
Lead, Dissolved	ug/L	0.17	100	100	99.2	102	99	102	70-130	3	20		
Selenium, Dissolved	ug/L	ND	100	100	108	113	108	113	70-130	4	20		
Thallium, Dissolved	ug/L	ND	100	100	101	103	101	103	70-130	2	20		
Uranium-238, Dissolved	ug/L	3.9	100	100	112	115	108	111	70-130	3	20		
Vanadium, Dissolved	ug/L	3.5	100	100	116	119	112	115	70-130	3	20		

MATRIX SPIKE SAMPLE: 2891662										
Parameter	Units	10427135001 Result	Spike	MS	MS	% Rec	Qualifiers			
			Conc.	Result	% Rec	Limits				
Antimony, Dissolved	ug/L	ND	100	107	107	70-130				
Arsenic, Dissolved	ug/L	ND	100	109	109	70-130				
Beryllium, Dissolved	ug/L	ND	100	90.7	91	70-130				
Boron, Dissolved	ug/L	89.0	100	179	90	70-130				
Cadmium, Dissolved	ug/L	ND	100	99.5	100	70-130				
Chromium, Dissolved	ug/L	ND	100	108	108	70-130				
Cobalt, Dissolved	ug/L	ND	100	108	107	70-130				
Lead, Dissolved	ug/L	ND	100	97.0	97	70-130				
Selenium, Dissolved	ug/L	ND	100	106	106	70-130				
Thallium, Dissolved	ug/L	ND	100	98.9	99	70-130				
Uranium-238, Dissolved	ug/L	ND	100	107	107	70-130				
Vanadium, Dissolved	ug/L	ND	100	111	111	70-130				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532754 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10427276001

METHOD BLANK: 2893227 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/17/18 11:21	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/17/18 11:21	
4-Bromofluorobenzene (S)	%.	97	75-125	04/17/18 11:21	
Toluene-d8 (S)	%.	96	75-125	04/17/18 11:21	

LABORATORY CONTROL SAMPLE: 2893228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	77.9	97	70-130	
1,2-Dichloroethane-d4 (S)	%.			103	75-125	
4-Bromofluorobenzene (S)	%.			95	75-125	
Toluene-d8 (S)	%.			97	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897401 2897402

Parameter	Units	10427958001		2897402		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	73.3	82.0	92	103	70-130	11	20
1,2-Dichloroethane-d4 (S)	%.						104	104	75-125		
4-Bromofluorobenzene (S)	%.						97	96	75-125		
Toluene-d8 (S)	%.						96	95	75-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 441140 Analysis Method: EPA 548.1
 QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
 Associated Lab Samples: 10427276001

METHOD BLANK: 2394100 Matrix: Water
 Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/19/18 21:45	

LABORATORY CONTROL SAMPLE: 2394101

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	45.7	91	64-137	

LABORATORY CONTROL SAMPLE: 2394102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	7.4J	82	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395124 2395125

Parameter	Units	35386626001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	49.5	48.1	99	96	64-137	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395126 2395127

Parameter	Units	35386626002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	20.6	22.1	41	44	64-137	7	30 M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 440817 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10427276001

METHOD BLANK: 2392537 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/18/18 19:40	
Paraquat	ug/L	ND	0.40	04/18/18 19:40	

LABORATORY CONTROL SAMPLE: 2392538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	2.1	103	70-130	
Paraquat	ug/L	2	1.7	85	70-130	

LABORATORY CONTROL SAMPLE: 2392539

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.58	144	50-150	
Paraquat	ug/L	.4	ND	75	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393245 2393246

Parameter	Units	35386136002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		
										RPD	RPD	Qual
Diquat	ug/L	0.30U	2	2	ND	ND	0	0	70-130		30	M1
Paraquat	ug/L	0.30U	2	2	ND	ND	0	0	70-130		30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393247 2393248

Parameter	Units	35386336001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		
										RPD	RPD	Qual
Diquat	ug/L	0.30U	2	2	1.9	2.1	96	103	70-130	7	30	
Paraquat	ug/L	0.30U	2	2	1.9	1.9	95	94	70-130	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 441812 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10427276001

METHOD BLANK: 2397907 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Dichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/25/18 15:02	
Monobromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Monochloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Trichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
2,3-Dibromopropanoic Acid (S)	%	115	70-130	04/25/18 15:02	

LABORATORY CONTROL SAMPLE: 2397908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	12.4	124	70-130	
Dichloroacetic Acid	ug/L	10	10.5	105	70-130	
Haloacetic Acids (Total)	ug/L	50	55.7	111	70-130	
Monobromoacetic Acid	ug/L	10	10.8	108	70-130	
Monochloroacetic Acid	ug/L	10	10.9	109	70-130	
Trichloroacetic Acid	ug/L	10	11.1	111	70-130	
2,3-Dibromopropanoic Acid (S)	%			123	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398523 2398524

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.75J	10	10	13.2	12.5	125	117	70-130	6	30	
Dichloroacetic Acid	ug/L	28.5	10	10	40.3	37.2	119	87	70-130	8	30	
Haloacetic Acids (Total)	ug/L	33.1	50	50	93.8	88.0	121	110	70-130	6	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	11.0	11.5	110	115	70-130	5	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	13.7	12.1	137	121	70-130	12	30	M1
Trichloroacetic Acid	ug/L	3.9	10	10	15.6	14.7	117	109	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						136	114	70-130		30	S0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398525 2398526

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.76J	10	10	12.5	12.9	117	122	70-130	4	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Parameter	Units	2398525		2398526		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Dichloroacetic Acid	ug/L	28.5	10	10	36.8	36.9	83	84	70-130	0	30	
Haloacetic Acids (Total)	ug/L	33.2	50	50	85.7	87.0	105	108	70-130	2	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	10.9	10.5	109	105	70-130	4	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	11.5	12.0	115	120	70-130	4	30	
Trichloroacetic Acid	ug/L	3.9	10	10	14.0	14.7	101	108	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						110	116	70-130		30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 534073	Analysis Method: EPA 8011
QC Batch Method: EPA 8011	Analysis Description: GCS 8011 EDB DBCP
Associated Lab Samples: 10427276001	

METHOD BLANK: 2901365 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

Parameter	Units	2901367								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532312 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10427276001

METHOD BLANK: 2890735 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/16/18 17:18	
4,4'-DDE	ug/L	ND	0.10	04/16/18 17:18	
4,4'-DDT	ug/L	ND	0.10	04/16/18 17:18	
Aldrin	ug/L	ND	0.050	04/16/18 17:18	
alpha-BHC	ug/L	ND	0.050	04/16/18 17:18	
alpha-Chlordane	ug/L	ND	0.050	04/16/18 17:18	
beta-BHC	ug/L	ND	0.050	04/16/18 17:18	
Chlordane (Technical)	ug/L	ND	0.50	04/16/18 17:18	
delta-BHC	ug/L	ND	0.050	04/16/18 17:18	
Dieldrin	ug/L	ND	0.10	04/16/18 17:18	
Endosulfan I	ug/L	ND	0.050	04/16/18 17:18	
Endosulfan II	ug/L	ND	0.10	04/16/18 17:18	
Endosulfan sulfate	ug/L	ND	0.10	04/16/18 17:18	
Endrin	ug/L	ND	0.10	04/16/18 17:18	
Endrin aldehyde	ug/L	ND	0.10	04/16/18 17:18	
Endrin ketone	ug/L	ND	0.10	04/16/18 17:18	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/16/18 17:18	
gamma-Chlordane	ug/L	ND	0.050	04/16/18 17:18	
Heptachlor	ug/L	ND	0.050	04/16/18 17:18	
Heptachlor epoxide	ug/L	ND	0.050	04/16/18 17:18	
Methoxychlor	ug/L	ND	0.50	04/16/18 17:18	
Toxaphene	ug/L	ND	1.5	04/16/18 17:18	
Decachlorobiphenyl (S)	%	78	30-143	04/16/18 17:18	
Tetrachloro-m-xylene (S)	%	89	62-125	04/16/18 17:18	

LABORATORY CONTROL SAMPLE & LCSD: 2890736

Parameter	Units	2890737								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
4,4'-DDD	ug/L	1	0.99	1.0	99	103	67-125	5	20	
4,4'-DDE	ug/L	1	0.97	1.0	97	102	68-125	6	20	
4,4'-DDT	ug/L	1	0.99	1.0	99	103	66-125	4	20	
Aldrin	ug/L	.5	0.41	0.44	83	89	46-125	7	20	
alpha-BHC	ug/L	.5	0.47	0.50	94	99	66-125	5	20	
alpha-Chlordane	ug/L	.5	0.46	0.48	92	97	72-125	5	20	
beta-BHC	ug/L	.5	0.46	0.48	93	97	72-125	4	20	
delta-BHC	ug/L	.5	0.39	0.41	78	82	37-141	4	20	
Dieldrin	ug/L	1	1.0	1.1	102	106	71-125	4	20	
Endosulfan I	ug/L	.5	0.43	0.45	86	89	69-125	4	20	
Endosulfan II	ug/L	1	0.99	1.0	99	103	73-125	4	20	
Endosulfan sulfate	ug/L	1	0.86	0.89	86	89	63-127	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Parameter	Units	2890736		2890737			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	0.94	0.98	94	98	72-125	4	20	
Endrin aldehyde	ug/L	1	0.94	0.97	94	97	70-125	4	20	
Endrin ketone	ug/L	1	0.99	1.0	99	103	72-127	4	20	
gamma-BHC (Lindane)	ug/L	.5	0.47	0.49	94	99	69-125	5	20	
gamma-Chlordane	ug/L	.5	0.41	0.43	81	85	64-125	4	20	
Heptachlor	ug/L	.5	0.46	0.49	92	98	54-125	6	20	
Heptachlor epoxide	ug/L	.5	0.47	0.48	93	97	72-125	4	20	
Methoxychlor	ug/L	5	4.8	5.0	96	100	67-127	4	20	
Decachlorobiphenyl (S)	%				80	81	30-143			
Tetrachloro-m-xylene (S)	%				90	93	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532343 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427276001

METHOD BLANK: 2891009 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/16/18 15:29	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/16/18 15:29	
Decachlorobiphenyl (S)	%	56	30-125	04/16/18 15:29	
Tetrachloro-m-xylene (S)	%	68	30-125	04/16/18 15:29	

LABORATORY CONTROL SAMPLE & LCSD: 2891010

Parameter	Units	2891011								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.3	1.4	67	70	47-125	4	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.4	1.4	69	71	54-125	2	20	
Decachlorobiphenyl (S)	%				61	61	30-125			
Tetrachloro-m-xylene (S)	%				68	71	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532581 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10427276001

METHOD BLANK: 2892635 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2,4-Dichlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2,4-Dimethylphenol	ug/L	ND	50.0	04/20/18 13:29	
2,4-Dinitrophenol	ug/L	ND	10.0	04/20/18 13:29	
2-Chlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2-Methylnaphthalene	ug/L	ND	10.0	04/20/18 13:29	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/20/18 13:29	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/20/18 13:29	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/20/18 13:29	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/20/18 13:29	
Acenaphthene	ug/L	ND	10.0	04/20/18 13:29	
Anthracene	ug/L	ND	10.0	04/20/18 13:29	
Benzo(a)pyrene	ug/L	ND	10.0	04/20/18 13:29	
Benzoic acid	ug/L	ND	50.0	04/20/18 13:29	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/20/18 13:29	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/20/18 13:29	
Butylbenzylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Di-n-butylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Di-n-octylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Diethylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Dimethylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Fluoranthene	ug/L	ND	10.0	04/20/18 13:29	
Fluorene	ug/L	ND	10.0	04/20/18 13:29	
Hexachlorobenzene	ug/L	ND	10.0	04/20/18 13:29	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/20/18 13:29	
Hexachloroethane	ug/L	ND	10.0	04/20/18 13:29	
Isophorone	ug/L	ND	10.0	04/20/18 13:29	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/20/18 13:29	
Pentachlorophenol	ug/L	ND	20.0	04/20/18 13:29	
Phenanthrene	ug/L	ND	10.0	04/20/18 13:29	
Phenol	ug/L	ND	10.0	04/20/18 13:29	
Pyrene	ug/L	ND	10.0	04/20/18 13:29	
2,4,6-Tribromophenol (S)	%	86	65-125	04/20/18 13:29	
2-Fluorobiphenyl (S)	%	72	56-125	04/20/18 13:29	
2-Fluorophenol (S)	%	71	55-125	04/20/18 13:29	
Nitrobenzene-d5 (S)	%	71	60-125	04/20/18 13:29	
p-Terphenyl-d14 (S)	%	92	58-125	04/20/18 13:29	
Phenol-d6 (S)	%	72	58-125	04/20/18 13:29	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

LABORATORY CONTROL SAMPLE & LCSD: 2892636		2892637									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	45.9	45.1	92	90	74-125	2	20		
2,4-Dichlorophenol	ug/L	50	46.6	43.2	93	86	68-125	8	20		
2,4-Dimethylphenol	ug/L	50	40.9J	35.4J	82	71	33-125		20		
2,4-Dinitrophenol	ug/L	50	41.2	42.6	82	85	30-127	3	20		
2-Chlorophenol	ug/L	50	44.4	40.1	89	80	61-125	10	20		
2-Methylnaphthalene	ug/L	50	44.6	41.2	89	82	67-125	8	20		
2-Methylphenol(o-Cresol)	ug/L	50	43.3	39.6	87	79	63-125	9	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	44.7	40.9	89	82	67-125	9	20		
3,3'-Dichlorobenzidine	ug/L	50	54.7	50.0	109	100	60-125	9	20		
4-Bromophenylphenyl ether	ug/L	50	45.6	45.8	91	92	75-125	0	20		
Acenaphthene	ug/L	50	43.7	43.7	87	87	74-125	0	20		
Anthracene	ug/L	50	44.4	44.9	89	90	75-125	1	20		
Benzo(a)pyrene	ug/L	50	46.8	47.3	94	95	75-125	1	20		
Benzoic acid	ug/L	50	19.8J	30.9J	40	62	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	40.2	36.8	80	74	55-125	9	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	55.5	52.7	111	105	72-129	5	20		
Butylbenzylphthalate	ug/L	50	52.7	51.2	105	102	69-127	3	20		
Di-n-butylphthalate	ug/L	50	49.3	49.3	99	99	75-125	0	20		
Di-n-octylphthalate	ug/L	50	56.2	54.2	112	108	69-131	4	20		
Diethylphthalate	ug/L	50	47.4	47.7	95	95	75-125	1	20		
Dimethylphthalate	ug/L	50	47.5	47.6	95	95	75-125	0	20		
Fluoranthene	ug/L	50	45.8	46.9	92	94	75-125	2	20		
Fluorene	ug/L	50	45.1	45.6	90	91	75-125	1	20		
Hexachlorobenzene	ug/L	50	46.9	47.3	94	95	74-125	1	20		
Hexachlorocyclopentadiene	ug/L	50	23.4J	19J	47	38	30-125		20		
Hexachloroethane	ug/L	50	38.5	35.5	77	71	30-125	8	20		
Isophorone	ug/L	50	44.5	40.9	89	82	72-125	8	20		
N-Nitrosodiphenylamine	ug/L	50	46.1	46.3	92	93	75-125	0	20		
Pentachlorophenol	ug/L	50	40.0	40.3	80	81	52-125	1	20		
Phenanthrene	ug/L	50	44.0	45.0	88	90	75-125	2	20		
Phenol	ug/L	50	41.9	38.1	84	76	59-125	9	20		
Pyrene	ug/L	50	49.5	49.1	99	98	75-125	1	20		
2,4,6-Tribromophenol (S)	%				94	93	65-125				
2-Fluorobiphenyl (S)	%				80	77	56-125				
2-Fluorophenol (S)	%				79	72	55-125				
Nitrobenzene-d5 (S)	%				79	72	60-125				
p-Terphenyl-d14 (S)	%				97	95	58-125				
Phenol-d6 (S)	%				79	72	58-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 20633

Analysis Method: EPA 8315A

QC Batch Method: EPA 8315A

Analysis Description: 8315 GCSV Aldehydes

Associated Lab Samples: 10427276001

METHOD BLANK: 82358

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/19/18 15:47	

LABORATORY CONTROL SAMPLE: 82359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	380	95	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 82485

82486

Parameter	Units	10427276001		82486		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Formaldehyde	ug/L	ND	400	400	527	399	130	98	35-167	28	20 H3,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 532263

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10427276001

METHOD BLANK: 2890529

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/18/18 15:52	

LABORATORY CONTROL SAMPLE: 2890531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	205	104	85-115	

SAMPLE DUPLICATE: 2890532

Parameter	Units	10427086001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	120 U	ND		20	B2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 534191 Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10427276001

METHOD BLANK: 2902447 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/25/18 09:37	

LABORATORY CONTROL SAMPLE: 2902448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	37.9	95	78-114	

MATRIX SPIKE SAMPLE: 2902449

Parameter	Units	10427228001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	<1.1	40	27.7	67	78-114	M1

SAMPLE DUPLICATE: 2902450

Parameter	Units	10428140001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	4.8	3.6J		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 532212

Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1

Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10427276001

METHOD BLANK: 2890393

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/13/18 07:37	

LABORATORY CONTROL SAMPLE: 2890394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.5	103	90-110	

SAMPLE DUPLICATE: 2890395

Parameter	Units	10426997005 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	842	852	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 532921

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 10427276001

METHOD BLANK: 2894181

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/18/18 14:24	

LABORATORY CONTROL SAMPLE: 2894182

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	82.0	82	80-120	

SAMPLE DUPLICATE: 2894183

Parameter	Units	10427110001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		10	

SAMPLE DUPLICATE: 2894184

Parameter	Units	10427577001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	96.0	94.0	2	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 442752	Analysis Method: SM 4500-CIO2
QC Batch Method: SM 4500-CIO2	Analysis Description: 4500CIO2 Chlorine Dioxide
Associated Lab Samples: 10427276001	

METHOD BLANK: 2402049 Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/25/18 13:30	H6

LABORATORY CONTROL SAMPLE: 2402050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	95	90-110	H6

SAMPLE DUPLICATE: 2402051

Parameter	Units	10427276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	1.6	1.6	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 534050	Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B	Analysis Description: 4500H+B pH
Associated Lab Samples: 10427276001	

LABORATORY CONTROL SAMPLE: 2901275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2901276

Parameter	Units	10427998001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.6	6.6	0	3	H6

SAMPLE DUPLICATE: 2901277

Parameter	Units	10428020002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	12.0	12.0	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532702 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10427276001

METHOD BLANK: 2893078 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/17/18 09:44	
Fluoride	mg/L	ND	0.050	04/17/18 09:44	

LABORATORY CONTROL SAMPLE: 2893079

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	98	90-110	
Fluoride	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893080 2893081

Parameter	Units	10427348003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	4.3	12.5	12.5	15.8	16.1	92	94	90-110	2	20	
Fluoride	mg/L	0.32	1	1	1.1	1.1	75	77	90-110	2	20 M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893082 2893083

Parameter	Units	10427276001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	56.5	12.5	12.5	58.2	59.0	13	20	90-110	1	20 M1	
Fluoride	mg/L	0.14	1	1	0.99	1.0	86	87	90-110	1	20 M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 442023 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427276001

METHOD BLANK: 2399126 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399127

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	39.8	99	85-115	

MATRIX SPIKE SAMPLE: 2399129

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	400	377	94	75-125	

SAMPLE DUPLICATE: 2399128

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 442024 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427276001

METHOD BLANK: 2399130 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	8.1	101	85-115	

MATRIX SPIKE SAMPLE: 2399133

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	77.2	97	75-125	

SAMPLE DUPLICATE: 2399132

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532346 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10427276001

METHOD BLANK: 2891044 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/13/18 16:43	FS

LABORATORY CONTROL SAMPLE: 2891045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891046 2891047

Parameter	Units	2891046		2891047		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427276001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium, Hexavalent	mg/L	0.011	.2	.2	0.012	0.012	1	1	85-115	0	20	FS,H1, M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 140957

Analysis Method: EPA 350.1 rev. 2 (1993)

QC Batch Method: EPA 350.1 rev. 2 (1993)

Analysis Description: 350.1 Ammonia Distilled

Associated Lab Samples: 10427276001

METHOD BLANK: 557837

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/20/18 07:08	

LABORATORY CONTROL SAMPLE: 557838

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557839

557840

Parameter	Units	12107304003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	5	4.8	5	5.0	94	99	90-110	5	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532358 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10427276001

METHOD BLANK: 2891118 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/13/18 17:20	FS
Nitrite as N	mg/L	ND	0.020	04/13/18 17:20	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/13/18 17:20	FS

LABORATORY CONTROL SAMPLE: 2891119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	102	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891120 2891121

Parameter	Units	10427206001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Nitrite as N	mg/L	0.020 U	1	1	0.97	1.0	97	101	90-110	4	20				
Nitrogen, NO2 plus NO3	mg/L	4.5	5	5	9.9	9.7	109	105	90-110	2	20				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891122 2891123

Parameter	Units	10427206006		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Nitrite as N	mg/L	0.020 U	1	1	0.97	1.0	96	102	90-110	6	20				
Nitrogen, NO2 plus NO3	mg/L	30.2	20	20	49.2	50.0	95	99	90-110	2	20 E				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 21104

Analysis Method: EPA 9016

QC Batch Method: EPA 9016

Analysis Description: 9016 Free Cyanide

Associated Lab Samples: 10427276001

METHOD BLANK: 84163

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/24/18 17:31	

LABORATORY CONTROL SAMPLE: 84164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	148	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84165

84166

Parameter	Units	10427352003		84166		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Cyanide, Free	ug/L	ND	150	150	142	143	95	95	80-120	1	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 533717 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10427276001

METHOD BLANK: 2899085 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/23/18 12:02	

LABORATORY CONTROL SAMPLE: 2899086

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	246	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899087 2899088

Parameter	Units	10427113002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	250	250	226	235	88	91	80-120	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899089 2899090

Parameter	Units	10427114001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	10.5	250	250	242	240	92	92	80-120	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

QC Batch: 532682 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10427276001

METHOD BLANK: 2893041 Matrix: Water
Associated Lab Samples: 10427276001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/17/18 13:20	

LABORATORY CONTROL SAMPLE: 2893042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893043 2893044

Parameter	Units	10426966001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	65.6	1	1	62.5	62.4	-312	-320	80-120	0	30	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893045 2893046

Parameter	Units	10426983001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.30	1	1	1.4	1.4	111	109	80-120	2	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Sample: FD-TT-06 **Lab ID: 10427276001** Collected: 04/12/18 12:30 Received: 04/13/18 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	8.79 ± 10.4 (18.6) C:NA T:NA	pCi/L	05/09/18 19:18	12587-46-1	
Gross Beta	EPA 900.0	23.9 ± 17.5 (30.2) C:NA T:NA	pCi/L	05/09/18 19:18	12587-47-2	
Radium-226	EPA 903.1	0.821 ± 0.548 (0.680) C:NA T:87%	pCi/L	05/02/18 11:43	13982-63-3	
Radium-228	EPA 904.0	0.217 ± 0.443 (0.976) C:84% T:66%	pCi/L	05/03/18 11:04	15262-20-1	
Total Radium	Total Radium Calculation	1.04 ± 0.991 (1.66)	pCi/L	05/07/18 12:58	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 296913	Analysis Method: EPA 900.0
QC Batch Method: EPA 900.0	Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 10427276001	

METHOD BLANK: 1453256	Matrix: Water
Associated Lab Samples: 10427276001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.297 ± 0.417 (1.39) C:NA T:NA	pCi/L	05/10/18 08:47	
Gross Beta	0.474 ± 0.723 (1.64) C:NA T:NA	pCi/L	05/10/18 08:47	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 295494

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10427276001

METHOD BLANK: 1446590

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.378 ± 0.342 (0.697) C:82% T:92%	pCi/L	05/03/18 11:03	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

QC Batch: 295484

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10427276001

METHOD BLANK: 1446564

Matrix: Water

Associated Lab Samples: 10427276001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.110 ± 0.306 (0.595) C:NA T:95%	pCi/L	05/02/18 11:43	

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
 ND - Not Detected at or above adjusted reporting limit.
 TNTC - Too Numerous To Count
 J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
 MDL - Adjusted Method Detection Limit.
 PQL - Practical Quantitation Limit.
 RL - Reporting Limit.
 S - Surrogate
 1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
 Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
 LCS(D) - Laboratory Control Sample (Duplicate)
 MS(D) - Matrix Spike (Duplicate)
 DUP - Sample Duplicate
 RPD - Relative Percent Difference
 NC - Not Calculable.
 SG - Silica Gel - Clean-Up
 U - Indicates the compound was analyzed for, but not detected.
 N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
 Act - Activity
 Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
 Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
 (MDC) - Minimum Detectable Concentration
 Trac - Tracer Recovery (%)
 Carr - Carrier Recovery (%)
 Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
 TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
 PASI-I Pace Analytical Services - Indianapolis
 PASI-M Pace Analytical Services - Minneapolis
 PASI-O Pace Analytical Services - Ormond Beach
 PASI-PA Pace Analytical Services - Greensburg
 PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 532610
 [M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
 Batch: 532638
 [M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
 Batch: 534191
 [BE] Batch extracted by solid phase extraction (SPE).

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

BATCH QUALIFIERS

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M Sample was yellow in color.

B2 Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

IO The internal standard response was outside the laboratory acceptance limits confirmed by reanalysis. The results reported are from the most QC compliant analysis.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

S0 Surrogate recovery outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427276

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427276001	FD-TT-06				
10427276001	FD-TT-06	EPA 531.1	444328		
10427276001	FD-TT-06	EPA 547	441208		
10427276001	FD-TT-06	EPA 549.2	440817	EPA 549.2	441186
10427276001	FD-TT-06	EPA 552.3	441812	EPA 552.3	442081
10427276001	FD-TT-06	EPA 8011	534073	EPA 8011	534336
10427276001	FD-TT-06	EPA 8015 Alcohol-Glycol	438905		
10427276001	FD-TT-06	EPA 8015 Alcohol-Glycol	438205		
10427276001	FD-TT-06	EPA Mod. 3510C	532312	EPA 8081B	532638
10427276001	FD-TT-06	EPA Mod. 3510C	532343	EPA 8082A	532610
10427276001	FD-TT-06	EPA 8315A	20633	EPA 8315A	20789
10427276001	FD-TT-06	EPA 8316	20643		
10427276001	FD-TT-06	EPA 200.7	532437	EPA 200.7	532779
10427276002	TS-SB-02	EPA 200.7	532437	EPA 200.7	532779
10427276001	FD-TT-06	EPA 200.8	532432	EPA 200.8	532568
10427276001	FD-TT-06	EPA 200.8	532434	EPA 200.8	532528
10427276002	TS-SB-02	EPA 200.8	532434	EPA 200.8	532528
10427276001	FD-TT-06	EPA 245.1	532450	EPA 245.1	532602
10427276002	TS-SB-02	EPA 245.1	532450	EPA 245.1	532602
10427276001	FD-TT-06	EPA 548.1	441140	EPA 548.1	441552
10427276001	FD-TT-06	EPA 3520	532581	EPA 8270D	532989
10427276001	FD-TT-06	EPA 524.2	532754		
10427276001	FD-TT-06				
10427276001	FD-TT-06	EPA 900.0	296913		
10427276001	FD-TT-06	EPA 903.1	295484		
10427276001	FD-TT-06	EPA 904.0	295494		
10427276001	FD-TT-06	Total Radium Calculation	297265		
10427276001	FD-TT-06	Hach 10360	532263	Hach 10360 Rev 1.1	532509
10427276001	FD-TT-06	EPA 1664A OG	534191		
10427276001	FD-TT-06	EPA 180.1	532212		
10427276001	FD-TT-06	SM 2540D	532921		
10427276001	FD-TT-06	SM 4500-CIO2	442752		
10427276001	FD-TT-06	SM 4500-H+B	534050		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427276

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427276001	FD-TT-06	Trivalent Chromium Calculation	534084		
10427276001	FD-TT-06	EPA 300.0	532702		
10427276001	FD-TT-06	EPA 300.1	441891		
10427276001	FD-TT-06	EPA 300.1	442023		
10427276001	FD-TT-06	EPA 300.1	441890		
10427276001	FD-TT-06	EPA 300.1	442024		
10427276001	FD-TT-06	SM 3500-Cr B Modified	532346		
10427276001	FD-TT-06	EPA 350.1			
10427276001	FD-TT-06	EPA 350.1 rev. 2 (1993)	140957	EPA 350.1 rev. 2 (1993)	141065
10427276001	FD-TT-06	EPA 353.2	532358		
10427276001	FD-TT-06	EPA 9016	21104	EPA 9016	21181
10427276001	FD-TT-06	SM 4500-CN-E	533717	SM 4500-CN-E	533784
10427276001	FD-TT-06	SM 4500-P B	532682	SM 4500-P E	532743

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

WO#: 10427276



Page: 1 of 1

	Chain-of-Custody Form		Work Order:
	PROJECT/CLIENT INFO		Turnaro
Facility Code:	MPCA-Freeway LF waters	Program Code (MDH Lab Only):	Lab Name:
Project Name:	MPCA-Freeway LF waters	Project Task Code:	Address: 18-00383 Epic Profile # 38716
Project Manager:			Phone No:
Potential Hazard?	If yes, add information to Sampler Comments Section		

FOR LAB USE ONLY
Lab Work Order Sticker

SAMPLE DETAILS										ANALYSIS REQUESTED						
SAMPLE TYPE CODES			LAB MATRIX CODES				FIELD MATRIX CODES			PRESERV.	ANALYSIS	Lab Sample No.	#			
Sample	Type	Code	Code	Code	Code	Code	Code	Code	Code							
Location Identifier	Sample Type	Date	Time	Start Depth, in feet	End Depth, in feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont					
FD-SB	S					G	NW	Wt Ground								
FD-TT-06	S	4/12/18	1230			G	NW	Wt Ground			41		X			201
TS-SB-02	S	4/12/18	1930			G	NW	Wt Ground			1			X		002
																4
																5
																6
																7
																8
																9
																10

No sample

DATA 4/12/18

Sampled By: David Anderson
 Sampler's Signature: David Anderson
 Phone #: _____

Receiving Comments:			
Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
David Anderson / Pace Analytical	4/12/18	DR Pace	4/13/18 800
David Anderson / Pace Analytical	4/13/18 0745		

T = 4.3
3.6



Document Name:
Sample Condition Upon Receipt Form

Document No.:
F-MN-L-213-rev.22

Document Revised: 14Dec2017
Page 1 of 2

Issuing Authority:
Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO# : 10427276

PM: JMA Due Date: 04/27/18

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: FB Temp Blank? Yes No

Thermometer 151401163 687A9155100842
 Used: G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 4.1, 3.4 Cooler Temp Corrected (°C): 4.3, 3.6 Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C Correction Factor: _____ Date and Initials of Person Examining Contents: R64/13/18

USDA Regulated Soil (N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y <input checked="" type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1 5/5</u> <u>1/1</u> <u>1/1</u>
Exceptions: <u>VOA</u> , Coliform, TOC/DOC, <u>Oil and Grease</u> , DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: <u>2/1/1</u> Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/13/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427276 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451	Subcontract To Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600	Requested Analysis WO# : 30249751 30249751
---	--	---

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	Rad 226	Rad 228	Total Radium	LAB USE ONLY
						HIND								
1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	3				X	X	X	X	
2														001
3														
4														
5														

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/16/18 1545	<i>[Signature]</i>	4-17-18 1005	
2					
3					

Cooler Temperature on Receipt °C Custody Seal Y or **(N)** Received on Ice Y or **(N)** Samples Intact **(Y)** or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace MN

Project # 30249751

Courier: Fed Ex UPS USPS Client Commercial Pace Other

Tracking #: 747598321967

Label	<u>OVIS</u>
LIMS Login	<u>DJM</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

pH paper Lot#	<u>10D1071</u>	Date and Initials of person examining contents:	<u>DS 4-17-18</u>
---------------	----------------	---	-------------------

Comments:

	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered	/			12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	/			13.
Organic Samples checked for dechlorination:	/			14.
Filtered volume received for Dissolved tests	/			15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				
				Initial when completed <u>DS</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	/			17.
Trip Blank Present:	/			18.
Trip Blank Custody Seals Present	/			
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed: <u>DS</u> Date: <u>4-17-18</u>

PH < 2

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody

WO#: 12107231



12107231

Page 65 of 83

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427276 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis									
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					Nitrogen, unionized ammonia, as N									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	LAB USE ONLY									
1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	1	X									
2																
3																
4																
5																
Transfers		Released By	Date/Time	Received By	Date/Time	Comments										
1		<i>[Signature]</i>	4/17/18	<i>[Signature]</i>	4/17/18 1800											
2		<i>[Signature]</i>	4/17/18	<i>[Signature]</i>	4/18/18 0730											
3																
Cooler Temperature on Receipt		4.0 °C		Custody Seal <input checked="" type="radio"/> or N		Received on Ice <input checked="" type="radio"/> or N		Samples Intact <input checked="" type="radio"/> or N								

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace-Mpls.

Project #:

WO# : 12107231
 PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.7 Cooler Temp Corrected °C: 4.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 4/17/18 GJ

Comments: BM 4/18/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Angela Loisel Date: 4/18/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

SAMPLE RECEIVING / LOG-IN CHECKLIST

Pace Analytical®

Client Pace Mon
 Receipt Record Page/Line # 9-2

Work Order #: 4610917

Recorded by (initials/date)

TS 4/17/18

Cooler
 Box
 Other _____

Qty Received
1

IR Gun (#202)
 Thermometer Used Digital Thermometer (#54)
 IR Gun (#402)

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time
<u>Blue</u>	<u>0950</u>						
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact	
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None	
Coolant Location: <input checked="" type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom		Coolant Location: <input type="checkbox"/> Dispersed / Top / Middle / Bottom	
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C
Temp Blank:			Temp Blank:			Temp Blank:	
Sample 1:	<u>1.7</u>	<u>1.7</u>	Sample 1:			Sample 1:	
Sample 2:	<u>1.0</u>	<u>1.0</u>	Sample 2:			Sample 2:	
Sample 3:	<u>1.1</u>	<u>1.1</u>	Sample 3:			Sample 3:	
When above 6 °C take a 3 Sample Average °C: _____		When above 6 °C take a 3 Sample Average °C: _____		When above 6 °C take a 3 Sample Average °C: _____		When above 6 °C take a 3 Sample Average °C: _____	
<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?	

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

Yes No
 Chain of Custody record(s)? If No, Initiated By _____
 Received for Lab Signed/Date/Time?
 USDA Soil Documents?
 Sampling / Field Forms?
 Other _____

COC Information

Pace COC Other _____
 COC ID Numbers: _____

Check COC for Accuracy

Yes No
 Analysis Requested?
 Sample ID matches COC?
 Sample Date and Time matches COC?
 All containers indicated are received?

Sample Condition Summary

N/A Yes No
 Broken containers/lids?
 Missing or incomplete labels?
 Illegible information on labels?
 Low volume received?
 Inappropriate or non-Pace containers received?
 VOC vials have headspace?
 Extra sample locations?
 Containers not listed on COC?

Check Sample Preservation

N/A Yes No
 Temperature Blank OR average sample temperature, ≥6° C?
 If "Yes" was thermal preservation required?
 If "Yes" were ALL samples collected the same day as receipt?
 Completed Sample Preservation Verification Form?
 Samples chemically preserved correctly?
 If "No", add wire tag and fill out Non-Conformance Form?
 Received unpreserved Terracore kit?
 If "Yes" unpreserved vials must be frozen

Work Order Not Logged In with Short Hold / Rush

Copies of COC To Lab Areas

Notes

Yes No
 Were all samples logged into Epic?
 Were all samples labelled?
 Were samples placed on scan locations?

Initial / Date :

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: <u>Pace minn</u>	Work Order # <u>4610917</u>
Receipt Log # <u>9-2</u>	Project Manager _____
Completed By (initials/date) <u>PS 4/17/18</u>	

COC ID # <u>WO# 10427276</u>												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓												
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID # <u>WO # 10427352</u>												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓	1.0											
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427276 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis													
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					Methyl alcohol/Ethylene glycol/EPA													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Preserved Containers													
1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	3														
2																				
3																				
4																				
5																				

50194585
LAB USE ONLY
001

						Comments													
Transfers	Released By	Date/Time	Received By	Date/Time															
1	<i>[Signature]</i>	4/16/18 1630	<i>[Signature]</i>																
2	<i>[Signature]</i>		<i>[Signature]</i>	4/17/18 0830															
3																			

Cooler Temperature on Receipt 23 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194585

Date/Time and Initials of person examining contents: SM 4/17/18 0945

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 1940

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: A 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2.1/2.3 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

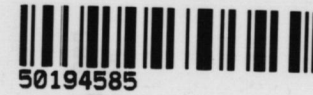
All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			/
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			/
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments:

Sample Container Count

WO#: 50194585



50194585

CLIENT: Pace MW

COC PAGE 1 of 1

COC ID# _____

Project # 50194585

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Bu Kit	Matrix (Soil/Water/Aqueous)	pH <2	pH >9	pH >	
	1																			1674				
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
Page 72 of 83	VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac	
	VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic	
	WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic	
	WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic	
	JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass			
			BG3U	250mL Unpreserved Clear Glass			

WO#: 35386559

Chain of Custody



35386559

Samples were sent

State Of Origin: MN



Workorder: 10427276

Workorder Name: 18-00383 MPCA-Freeway LF Water

Owner Received Date: 4/13/2018

Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis																																																																																																																																																									
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668					<table border="1"> <tr> <th colspan="10">Preserved Containers</th> <th>Aldicarb/Carbofuran, Method 531.1</th> <th>Bromate/Chlorite EPA 300.1</th> <th>Chlorine dioxide SM+500ClO2</th> <th>Diquat EPA 549.2</th> <th>Endothall EPA 548.1</th> <th>Glyphosate EPA 547</th> <th>Haloacetic acids, total (HAAs) EPA</th> </tr> <tr> <th>Item</th> <th>Sample ID</th> <th>Sample Type</th> <th>Collect Date/Time</th> <th>Lab ID</th> <th>Matrix</th> <th>Unpreserved</th> <th>Other</th> <th>NA2S2O3</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <td>1</td> <td>FD-TT-06</td> <td>PS</td> <td>4/12/2018 12:30</td> <td>10427276001</td> <td>Water</td> <td>2</td> <td>3</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										Preserved Containers										Aldicarb/Carbofuran, Method 531.1	Bromate/Chlorite EPA 300.1	Chlorine dioxide SM+500ClO2	Diquat EPA 549.2	Endothall EPA 548.1	Glyphosate EPA 547	Haloacetic acids, total (HAAs) EPA	Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Other	NA2S2O3										1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	2	3	2						X	X	X	X	X	X	X	2																						3																						4																						5																					
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3																																																																																																																																																																
Cooler Temperature on Receipt 3.4°C				Custody Seal Y or (N)				Received on Ice (Y) or N				Samples Intact (Y) or N																																																																																																																																																				

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #
Project Manager:
Client:

WO# : 35386559

PM: ADC Due Date: 04/27/18
CLIENT: PACMIN

Date and Initials of person:
Examining contents: PLD
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T-338 Date: 4-17-18 Time: 11:00 Initials: NMP

State of Origin: _____

Cooler #1 Temp. °C 3.4 (Visual) +0 (Correction Factor) 3.4 (Actual)
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual)

- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832 2036

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments): _____

Project Manager Review: _____

Date: _____



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 27, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427276
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-06 (10427276001)	A181604-01	Water	04/12/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/17/2018. Sample was received at 4.8 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

The LC footnote on sample A181604-01 states that there was a low CCV recovery for prometon. The lower control limit is 80% and the lowest recovery was 77.5%.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427276
 Project Manager: Jennifer Anderson

FD-TT-06 (10427276001)

Date Sampled

A181604-01 (Water)

04/12/2018 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
---------	--------	-----------------	-------	----------	----------	----------	--------	------------

Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804168

Acetochlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 13:09	EPA 8270D	

Surrogate: Atrazine-d5		99.3 %		65.1-122	04/19/2018	04/24/2018 13:09	EPA 8270D	
Surrogate: Parathion-d10		139 %		22.3-159	04/19/2018	04/24/2018 13:09	EPA 8270D	
Surrogate: Triphenyl phosphate		149 %		65.2-151	04/19/2018	04/24/2018 13:09	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804156

2,4-D	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/18/2018	04/24/2018 21:50	EPA 8151A	

Surrogate: 2,4-D-d5		97.3 %		44.2-121	04/18/2018	04/24/2018 21:50	EPA 8151A	
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2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427276
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Blank (A804168-BLK1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 19:13

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.6</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.3</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.529</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>65.2-151</i>			

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Acetochlor	0.954	0.50	ug/L	1.000		95.4	67.5-120			
Alachlor	0.959	0.50	ug/L	1.000		95.9	71.7-120			
Atrazine	0.891	0.50	ug/L	1.000		89.1	72.8-113			
Chlorpyrifos	0.817	0.50	ug/L	1.000		81.7	65.3-119			
Cyanazine	1.01	0.20	ug/L	1.000		101	49.5-140			
Desethylatrazine	0.951	0.50	ug/L	1.000		95.1	66.9-116			
Deisopropylatrazine	0.729	0.50	ug/L	1.000		72.9	44.3-110			
Dimethenamid	0.964	0.50	ug/L	1.000		96.4	63.8-116			
EPTC	0.559	0.50	ug/L	1.000		55.9	41.7-102			
Ethalfuralin	0.538	0.50	ug/L	1.000		53.8	41-127			
Fonofos	0.709	0.50	ug/L	1.000		70.9	59.7-118			
Metolachlor	0.984	0.50	ug/L	1.000		98.4	71.7-122			
Metribuzin	0.911	0.50	ug/L	1.000		91.1	66.6-128			
Pendimethalin	0.946	0.50	ug/L	1.000		94.6	55.5-137			
Phorate	0.577	0.30	ug/L	1.000		57.7	41.2-114			
Prometon	0.958	0.50	ug/L	1.000		95.8	66.3-120			
Propachlor	0.933	0.50	ug/L	1.000		93.3	65.8-119			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

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Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427276
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Propazine	0.840	0.50	ug/L	1.000		84.0	72-122			
Simazine	0.892	0.50	ug/L	1.000		89.2	72.8-113			
Terbufos	0.514	0.20	ug/L	1.000		51.4	38.6-115			
Triallate	0.622	0.50	ug/L	1.000		62.2	51.4-116			
Trifluralin	0.588	0.50	ug/L	1.000		58.8	46.1-134			
Surrogate: Atrazine-d5	0.451		ug/L	0.5000		90.2	65.1-122			
Surrogate: Parathion-d10	0.495		ug/L	0.5000		99.0	22.3-159			
Surrogate: Triphenyl phosphate	0.534		ug/L	0.5000		107	65.2-151			

Matrix Spike (A804168-MS1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:34

Acetochlor	1.09	0.50	ug/L	0.9346	0.0378	113	67.3-128			
Alachlor	2.58	0.50	ug/L	0.9346	1.50	116	58.2-150			
Atrazine	1.25	0.50	ug/L	0.9346	0.324	98.7	70.1-120			
Chlorpyrifos	1.26	0.50	ug/L	0.9346	0.121	122	73.3-118			M
Cyanazine	1.79	0.20	ug/L	0.9346	0.659	121	60.6-140			
Desethylatrazine	1.05	0.50	ug/L	0.9346	0.0617	106	69.7-122			
Deisopropylatrazine	0.867	0.50	ug/L	0.9346	0.246	66.4	48-121			
Dimethenamid	1.16	0.50	ug/L	0.9346	0.0699	117	63.7-123			
EPTC	0.734	0.50	ug/L	0.9346	0.100	67.8	58-109			
Ethalfuralin	0.652	0.50	ug/L	0.9346	ND	69.7	59.3-129			
Fonofos	0.605	0.50	ug/L	0.9346	0.0263	61.9	73.5-108			M
Metolachlor	65.6	0.50	ug/L	0.9346	67.5	NR	40.9-156			M1, E
Metribuzin	1.03	0.50	ug/L	0.9346	0.0606	104	70.9-136			
Pendimethalin	1.35	0.50	ug/L	0.9346	0.0391	141	55.4-155			
Phorate	0.563	0.30	ug/L	0.9346	0.112	48.2	60.2-108			M
Prometon	1.18	0.50	ug/L	0.9346	0.266	97.8	74.7-124			
Propachlor	0.724	0.50	ug/L	0.9346	ND	77.5	72.3-115			
Propazine	1.31	0.50	ug/L	0.9346	0.472	89.1	73.7-124			
Simazine	0.915	0.50	ug/L	0.9346	ND	97.9	74.8-114			
Terbufos	0.564	0.20	ug/L	0.9346	ND	60.4	56.1-114			
Triallate	0.620	0.50	ug/L	0.9346	ND	66.4	65.5-107			
Trifluralin	0.873	0.50	ug/L	0.9346	0.0370	89.5	58-149			
Surrogate: Atrazine-d5	0.443		ug/L	0.4673		94.7	65.1-122			
Surrogate: Parathion-d10	0.528		ug/L	0.4673		113	22.3-159			
Surrogate: Triphenyl phosphate	0.702		ug/L	0.4673		150	65.2-151			

Matrix Spike Dup (A804168-MSD1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02

Acetochlor	1.10	0.50	ug/L	0.9434	0.0378	112	67.3-128	0.205	20	
Alachlor	2.49	0.50	ug/L	0.9434	1.50	106	58.2-150	3.47	20	
Atrazine	1.20	0.50	ug/L	0.9434	0.324	93.2	70.1-120	3.57	20	
Chlorpyrifos	1.25	0.50	ug/L	0.9434	0.121	119	73.3-118	1.32	20	M
Cyanazine	1.75	0.20	ug/L	0.9434	0.659	116	60.6-140	2.18	20	
Desethylatrazine	1.03	0.50	ug/L	0.9434	0.0617	102	69.7-122	2.35	20	
Deisopropylatrazine	0.790	0.50	ug/L	0.9434	0.246	57.7	48-121	9.23	20	



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 Madison, WI 53718
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 608.221.4889 Fax

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 Project Number: 10427276
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Matrix Spike Dup (A804168-MSD1)	Source: A181612-06			Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02						
Dimethenamid	1.14	0.50	ug/L	0.9434	0.0699	113	63.7-123	1.98	20	
EPTC	0.759	0.50	ug/L	0.9434	0.100	69.8	58-109	3.38	20	
Ethalfuralin	0.650	0.50	ug/L	0.9434	ND	68.9	59.3-129	0.280	20	
Fonofos	0.581	0.50	ug/L	0.9434	0.0263	58.8	73.5-108	4.15	20	M
Metolachlor	63.8	0.50	ug/L	0.9434	67.5	NR	40.9-156	2.74	20	M1, E
Metribuzin	1.01	0.50	ug/L	0.9434	0.0606	100	70.9-136	2.66	20	
Pendimethalin	1.34	0.50	ug/L	0.9434	0.0391	138	55.4-155	1.06	20	
Phorate	0.583	0.30	ug/L	0.9434	0.112	49.9	60.2-108	3.49	20	M
Prometon	1.15	0.50	ug/L	0.9434	0.266	93.9	74.7-124	2.45	20	
Propachlor	0.706	0.50	ug/L	0.9434	ND	74.8	72.3-115	2.52	20	
Propazine	1.29	0.50	ug/L	0.9434	0.472	86.8	73.7-124	1.08	20	
Simazine	0.862	0.50	ug/L	0.9434	ND	91.4	74.8-114	5.89	20	
Terbufos	0.553	0.20	ug/L	0.9434	ND	58.6	56.1-114	2.07	20	
Triallate	0.606	0.50	ug/L	0.9434	ND	64.2	65.5-107	2.43	20	M
Trifluralin	0.840	0.50	ug/L	0.9434	0.0370	85.1	58-149	3.90	20	
Surrogate: Atrazine-d5	0.431		ug/L	0.4717		91.4	65.1-122			
Surrogate: Parathion-d10	0.485		ug/L	0.4717		103	22.3-159			
Surrogate: Triphenyl phosphate	0.641		ug/L	0.4717		136	65.2-151			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

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Project Number: 10427276
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804156 - EPA 3510C

Blank (A804156-BLK1)

Prepared: 04/18/2018 Analyzed: 04/24/2018 19:26

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.01 ug/L 2.016 99.7 44.2-121

LCS (A804156-BS1)

Prepared: 04/18/2018 Analyzed: 04/25/2018 03:47

2,4-D	1.74	0.50	ug/L	2.000		86.9	64.6-148			
2,4-DB	1.99	0.50	ug/L	2.000		99.5	66.7-143			
2,4,5-T	1.78	0.50	ug/L	2.000		88.9	63.4-133			
2,4,5-TP (Silvex)	1.77	0.50	ug/L	2.000		88.4	63-145			
Bentazon	1.06	0.50	ug/L	1.000		106	52.5-139			
Dicamba	1.67	0.50	ug/L	2.000		83.7	55.4-143			
MCPA	1.65	0.30	ug/L	2.000		82.7	33.5-143			
Picloram	0.830	0.50	ug/L	1.000		83.0	47.9-113			
Triclopyr	1.74	0.50	ug/L	2.000		87.0	65.1-141			

Surrogate: 2,4-D-d5

1.94 ug/L 2.016 96.2 44.2-121

LCS Dup (A804156-BSD1)

Prepared: 04/18/2018 Analyzed: 04/25/2018 04:22

2,4-D	1.74	0.50	ug/L	2.000		87.2	64.6-148	0.362	20	
2,4-DB	2.01	0.50	ug/L	2.000		100	66.7-143	0.905	20	
2,4,5-T	1.74	0.50	ug/L	2.000		87.0	63.4-133	2.10	20	
2,4,5-TP (Silvex)	1.85	0.50	ug/L	2.000		92.5	63-145	4.55	20	
Bentazon	0.953	0.50	ug/L	1.000		95.3	52.5-139	10.4	20	
Dicamba	1.79	0.50	ug/L	2.000		89.4	55.4-143	6.62	20	
MCPA	1.79	0.30	ug/L	2.000		89.4	33.5-143	7.77	20	
Picloram	0.822	0.50	ug/L	1.000		82.2	47.9-113	1.02	20	
Triclopyr	1.86	0.50	ug/L	2.000		93.1	65.1-141	6.76	20	

Surrogate: 2,4-D-d5

1.82 ug/L 2.016 90.5 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

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1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427276
Project Manager: Jennifer Anderson

Notes and Definitions

- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- E The concentration indicated is above the instrument calibration range. This value is an estimated concentration.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181604



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427276 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To						Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																				
							MDA List II		MDA List I													
							Preserved Containers															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved															LAB USE ONLY	
1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	2																01
2																						
3																						
4																						
5																						
																			Comments			
Transfers	Released By	Date/Time	Received By	Date/Time																		
1	<i>[Signature]</i>	4/16/18 1630	<i>[Signature]</i>	4/17/18																		
2				0940																		
3																						
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																
4.8 °C		Y or N		Y or N		Y or N																

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

160147274
exp 7/12/18

May 10, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137
 Mississippi Certification #: MN00064
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon NwTPH Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DW Certification #: 9952 C
 West Virginia DEP Certification #: 382
 Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 Alaska Certification UST-107
 California Certification #2973
 California Certification #2973
 Montana Certificate #CERT0103
 Alaska Certification #MN01084
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
 North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007
 Nevada DNR #MN010842018-1
 Oklahoma Department of Environmental Quality
 California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
 Georgia Certification #: C040
 Guam Certification
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #57971 and 57972
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427352001	TS-SB-05	Water	04/13/18 11:20	04/13/18 16:35
10427352002	TS-SB-07	Water	04/13/18 13:30	04/13/18 16:35
10427352003	TS-SB-08	Water	04/13/18 15:20	04/13/18 16:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427352001	TS-SB-05	EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	AT1	38	PASI-M
10427352002	TS-SB-07	EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	AT1	38	PASI-M
10427352003	TS-SB-08	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	38	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NJV	2	PASI-PA
EPA 903.1	KAC	1	PASI-PA		
EPA 904.0	JLW	1	PASI-PA		
Total Radium Calculation	CMC	1	PASI-PA		
Hach 10360 Rev 1.1	AJS	1	PASI-M		
EPA 1664A OG	AR3	1	PASI-M		
EPA 180.1	JFP	1	PASI-M		
SM 2540D	NAS	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	AR3	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-05	Lab ID: 10427352001	Collected: 04/13/18 11:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	3810	ug/L	200	1	04/17/18 11:11	04/19/18 17:06	7429-90-5	
Barium, Dissolved	2750	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:06	7440-39-3	
Copper, Dissolved	11.9	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:06	7440-50-8	
Manganese, Dissolved	2440	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:06	7439-96-5	
Nickel, Dissolved	22.4	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:06	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:06	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:06	7440-31-5	
Zinc, Dissolved	77.6	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:06	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	594	ug/L	2.5	5	04/18/18 09:40	04/19/18 12:46	7440-47-3	
Total Hardness by 2340B	2230000	ug/L	14100	100	04/18/18 09:40	04/19/18 12:48		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.4	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-36-0	
Arsenic, Dissolved	4.4	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/25/18 08:52	7440-41-7	
Boron, Dissolved	859	ug/L	100	20	04/23/18 14:28	04/24/18 19:33	7440-42-8	
Cadmium, Dissolved	0.27	ug/L	0.080	1	04/23/18 14:28	04/25/18 08:52	7440-43-9	
Chromium, Dissolved	14.0	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-47-3	
Cobalt, Dissolved	4.8	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-48-4	
Lead, Dissolved	24.3	ug/L	0.10	1	04/23/18 14:28	04/25/18 08:52	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7782-49-2	
Thallium, Dissolved	0.21	ug/L	0.10	1	04/23/18 14:28	04/25/18 08:52	7440-28-0	
Uranium-238, Dissolved	1.8	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:52	7440-61-1	
Vanadium, Dissolved	12.0	ug/L	1.0	1	04/23/18 14:28	04/25/18 08:52	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:00	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	83-32-9	
Anthracene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	50-32-8	
Benzoic acid	ND	ug/L	521	10	04/19/18 14:59	04/23/18 20:06	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.1	1	04/19/18 14:59	04/23/18 17:38	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.1	1	04/19/18 14:59	04/23/18 17:38	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	51-28-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-05		Lab ID: 10427352001	Collected: 04/13/18 11:20	Received: 04/13/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Di-n-octylphthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	206-44-0	
Fluorene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.1	1	04/19/18 14:59	04/23/18 17:38	77-47-4	
Hexachloroethane	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	67-72-1	
Isophorone	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	95-48-7	
3&4-Methylphenol(m&p Cresol)	232	ug/L	208	10	04/19/18 14:59	04/23/18 20:06		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	86-30-6	
Pentachlorophenol	ND	ug/L	20.8	1	04/19/18 14:59	04/23/18 17:38	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	85-01-8	
Phenol	12.3	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	108-95-2	
Pyrene	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	04/19/18 14:59	04/23/18 17:38	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	75	%	60-125	1	04/19/18 14:59	04/23/18 17:38	4165-60-0	
2-Fluorobiphenyl (S)	78	%	56-125	1	04/19/18 14:59	04/23/18 17:38	321-60-8	
p-Terphenyl-d14 (S)	66	%	58-125	1	04/19/18 14:59	04/23/18 17:38	1718-51-0	
Phenol-d6 (S)	72	%	58-125	1	04/19/18 14:59	04/23/18 17:38	13127-88-3	
2-Fluorophenol (S)	76	%	55-125	1	04/19/18 14:59	04/23/18 17:38	367-12-4	
2,4,6-Tribromophenol (S)	98	%	65-125	1	04/19/18 14:59	04/23/18 17:38	118-79-6	

Sample: TS-SB-07		Lab ID: 10427352002	Collected: 04/13/18 13:30	Received: 04/13/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	92800	ug/L	200	1	04/17/18 11:11	04/19/18 17:09	7429-90-5	
Barium, Dissolved	2810	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:09	7440-39-3	
Copper, Dissolved	313	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:09	7440-50-8	
Manganese, Dissolved	9940	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:09	7439-96-5	
Nickel, Dissolved	215	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:09	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:09	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:09	7440-31-5	
Zinc, Dissolved	492	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:09	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	713	ug/L	2.5	5	04/18/18 09:40	04/19/18 12:50	7440-47-3	
Total Hardness by 2340B	9500000	ug/L	70500	500	04/18/18 09:40	04/19/18 13:01		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	1.1	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-36-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-07	Lab ID: 10427352002	Collected: 04/13/18 13:30	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic, Dissolved	71.2	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-38-2	
Beryllium, Dissolved	2.8	ug/L	0.20	1	04/23/18 14:28	04/26/18 09:14	7440-41-7	
Boron, Dissolved	889	ug/L	250	50	04/23/18 14:28	04/25/18 08:55	7440-42-8	
Cadmium, Dissolved	3.8	ug/L	0.080	1	04/23/18 14:28	04/26/18 09:14	7440-43-9	
Chromium, Dissolved	165	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-47-3	
Cobalt, Dissolved	105	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-48-4	
Lead, Dissolved	113	ug/L	0.10	1	04/23/18 14:28	04/26/18 09:14	7439-92-1	
Selenium, Dissolved	3.8	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7782-49-2	
Thallium, Dissolved	2.9	ug/L	0.10	1	04/23/18 14:28	04/26/18 09:14	7440-28-0	
Uranium-238, Dissolved	8.5	ug/L	0.50	1	04/23/18 14:28	04/26/18 09:14	7440-61-1	
Vanadium, Dissolved	205	ug/L	1.0	1	04/23/18 14:28	04/26/18 09:14	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	0.35	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:03	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	83-32-9	
Anthracene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	50-32-8	
Benzoic acid	ND	ug/L	52.6	1	04/19/18 14:59	04/23/18 18:07	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	111-44-4	
2-Chlorophenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.6	1	04/19/18 14:59	04/23/18 18:07	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	120-83-2	
Diethylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.6	1	04/19/18 14:59	04/23/18 18:07	105-67-9	
Dimethylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	117-81-7	
Fluoranthene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	206-44-0	
Fluorene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	86-73-7	
Hexachlorobenzene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.6	1	04/19/18 14:59	04/23/18 18:07	77-47-4	
Hexachloroethane	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	67-72-1	
Isophorone	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.1	1	04/19/18 14:59	04/23/18 18:07		
N-Nitrosodiphenylamine	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	86-30-6	
Pentachlorophenol	ND	ug/L	21.1	1	04/19/18 14:59	04/23/18 18:07	87-86-5	
Phenanthrene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	85-01-8	
Phenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	108-95-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-07	Lab ID: 10427352002	Collected: 04/13/18 13:30	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Pyrene	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.5	1	04/19/18 14:59	04/23/18 18:07	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	71	%	60-125	1	04/19/18 14:59	04/23/18 18:07	4165-60-0	
2-Fluorobiphenyl (S)	73	%	56-125	1	04/19/18 14:59	04/23/18 18:07	321-60-8	
p-Terphenyl-d14 (S)	55	%	58-125	1	04/19/18 14:59	04/23/18 18:07	1718-51-0	S0
Phenol-d6 (S)	76	%	58-125	1	04/19/18 14:59	04/23/18 18:07	13127-88-3	
2-Fluorophenol (S)	72	%	55-125	1	04/19/18 14:59	04/23/18 18:07	367-12-4	
2,4,6-Tribromophenol (S)	92	%	65-125	1	04/19/18 14:59	04/23/18 18:07	118-79-6	
<hr/>								
Sample: TS-SB-08								
Lab ID: 10427352003 Collected: 04/13/18 15:20 Received: 04/13/18 16:35 Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	7.0	Std. Units	0.10	1		04/13/18 15:20		
Field Temperature	10.5	deg C	0.50	1		04/13/18 15:20		
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/04/18 08:25	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/04/18 08:25	1563-66-2	
Surrogates								
BDMC (S)	117	%	80-120	1		05/04/18 08:25		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		04/27/18 02:20		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/18/18 23:22	04/19/18 19:47	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/18/18 23:22	04/19/18 19:47	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/25/18 19:12	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	183	%	70-130	1	04/21/18 00:13	04/25/18 19:12	600-05-5	S3
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0099	1	04/24/18 14:16	04/25/18 00:39	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0099	1	04/24/18 14:16	04/25/18 00:39	106-93-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08	Lab ID: 10427352003	Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8011 GCS EDB and DBCP Analytical Method: EPA 8011 Preparation Method: EPA 8011								
Surrogates								
4-Bromofluorobenzene (S)	128	%	30-150	1	04/24/18 14:16	04/25/18 00:39	460-00-4	
8015M Alcohols in water Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	ug/L	5000	1		04/25/18 15:50	67-56-1	
8015M Glycols in water Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/23/18 15:53	107-21-1	
8081B GCS Pesticides Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	309-00-2	
alpha-BHC	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	319-84-6	
beta-BHC	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	319-85-7	
delta-BHC	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	58-89-9	
Chlordane (Technical)	ND	ug/L	5.3	10	04/17/18 09:44	04/19/18 22:35	57-74-9	
alpha-Chlordane	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	5103-71-9	
gamma-Chlordane	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	5103-74-2	
4,4'-DDD	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	72-54-8	
4,4'-DDE	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	72-55-9	
4,4'-DDT	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	50-29-3	
Dieldrin	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	60-57-1	
Endosulfan I	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	959-98-8	
Endosulfan II	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	33213-65-9	
Endosulfan sulfate	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	1031-07-8	
Endrin	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	72-20-8	
Endrin aldehyde	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	7421-93-4	
Endrin ketone	ND	ug/L	1.1	10	04/17/18 09:44	04/19/18 22:35	53494-70-5	
Heptachlor	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	76-44-8	
Heptachlor epoxide	ND	ug/L	0.53	10	04/17/18 09:44	04/19/18 22:35	1024-57-3	
Methoxychlor	ND	ug/L	5.3	10	04/17/18 09:44	04/19/18 22:35	72-43-5	
Toxaphene	ND	ug/L	15.8	10	04/17/18 09:44	04/19/18 22:35	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	62-125	10	04/17/18 09:44	04/19/18 22:35	877-09-8	2M, D3, S4
Decachlorobiphenyl (S)	0	%	30-143	10	04/17/18 09:44	04/19/18 22:35	2051-24-3	S4
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	04/17/18 09:43	04/18/18 13:47	11100-14-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08	Lab ID: 10427352003	Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
Surrogates								
Tetrachloro-m-xylene (S)	70	%	30-125	1	04/17/18 09:43	04/18/18 13:47	877-09-8	
Decachlorobiphenyl (S)	31	%	30-125	1	04/17/18 09:43	04/18/18 13:47	2051-24-3	
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/19/18 09:11	04/19/18 16:12	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/18/18 17:24	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/17/18 11:11	04/19/18 17:11	7429-90-5	
Barium, Dissolved	1080	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:11	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:11	7440-50-8	
Manganese, Dissolved	226	ug/L	5.0	1	04/17/18 11:11	04/19/18 17:11	7439-96-5	
Nickel, Dissolved	30.9	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:11	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/17/18 11:11	04/19/18 17:11	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/17/18 11:11	04/19/18 17:11	7440-31-5	
Zinc, Dissolved	43.0	ug/L	20.0	1	04/17/18 11:11	04/19/18 17:11	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	21.6	ug/L	2.5	5	04/18/18 09:40	04/19/18 12:54	7440-47-3	
Total Hardness by 2340B	1410000	ug/L	14100	100	04/18/18 09:40	04/19/18 12:56		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	0.57	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-36-0	
Arsenic, Dissolved	6.6	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/25/18 08:58	7440-41-7	
Boron, Dissolved	6960	ug/L	250	50	04/23/18 14:28	04/24/18 19:39	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/25/18 08:58	7440-43-9	
Chromium, Dissolved	7.1	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-47-3	
Cobalt, Dissolved	5.0	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-48-4	
Lead, Dissolved	4.9	ug/L	0.10	1	04/23/18 14:28	04/25/18 08:58	7439-92-1	
Selenium, Dissolved	1.1	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/25/18 08:58	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/25/18 08:58	7440-61-1	
Vanadium, Dissolved	1.9	ug/L	1.0	1	04/23/18 14:28	04/25/18 08:58	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:05	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/19/18 08:10	04/19/18 23:08		IO

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08		Lab ID: 10427352003	Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	83-32-9	
Anthracene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	50-32-8	
Benzoic acid	ND	ug/L	52.1	1	04/16/18 17:28	04/20/18 18:13	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	111-44-4	
2-Chlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.1	1	04/16/18 17:28	04/20/18 18:13	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	120-83-2	
Diethylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	84-66-2	
2,4-Dimethylphenol	ND	ug/L	52.1	1	04/16/18 17:28	04/20/18 18:13	105-67-9	
Dimethylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	117-81-7	
Fluoranthene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	206-44-0	
Fluorene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	86-73-7	
Hexachlorobenzene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.1	1	04/16/18 17:28	04/20/18 18:13	77-47-4	
Hexachloroethane	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	67-72-1	
Isophorone	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.8	1	04/16/18 17:28	04/20/18 18:13		
N-Nitrosodiphenylamine	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	86-30-6	
Pentachlorophenol	ND	ug/L	20.8	1	04/16/18 17:28	04/20/18 18:13	87-86-5	
Phenanthrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	85-01-8	
Phenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	108-95-2	
Pyrene	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.4	1	04/16/18 17:28	04/20/18 18:13	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	74	%	60-125	1	04/16/18 17:28	04/20/18 18:13	4165-60-0	
2-Fluorobiphenyl (S)	76	%	56-125	1	04/16/18 17:28	04/20/18 18:13	321-60-8	
p-Terphenyl-d14 (S)	74	%	58-125	1	04/16/18 17:28	04/20/18 18:13	1718-51-0	
Phenol-d6 (S)	75	%	58-125	1	04/16/18 17:28	04/20/18 18:13	13127-88-3	
2-Fluorophenol (S)	71	%	55-125	1	04/16/18 17:28	04/20/18 18:13	367-12-4	
2,4,6-Tribromophenol (S)	92	%	65-125	1	04/16/18 17:28	04/20/18 18:13	118-79-6	
524.2 MSV		Analytical Method: EPA 524.2						
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/17/18 14:31		
Surrogates								
4-Bromofluorobenzene (S)	96	%	75-125	1		04/17/18 14:31	460-00-4	
Toluene-d8 (S)	94	%	75-125	1		04/17/18 14:31	2037-26-5	
1,2-Dichloroethane-d4 (S)	104	%	75-125	1		04/17/18 14:31	17060-07-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

Sample: TS-SB-08	Lab ID: 10427352003	Collected: 04/13/18 15:20	Received: 04/13/18 16:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:							
Field pH	7.0	Std. Units		1		04/13/18 15:20		
Field Temperature	10.5	deg C		1		04/13/18 15:20		
Hach 10360 Rev 1.1 BOD	Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360							
BOD, 5 day	ND	mg/L	20.0	10	04/13/18 17:23	04/18/18 16:40		
1664 HEM, Oil and Grease	Analytical Method: EPA 1664A OG							
Oil and Grease	ND	mg/L	5.0	1		04/25/18 12:19		1M
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	260	NTU	15.0	50		04/14/18 14:47		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	109	mg/L	10.0	1		04/20/18 11:12		
4500ClO2 Chlorine Dioxide	Analytical Method: SM 4500-ClO2							
Chlorine Dioxide	0.11	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.9	Std. Units	0.10	1		04/24/18 14:43		H6
Trivalent Chromium Calculation	Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	0.022	mg/L	0.010	1		04/24/18 15:01		
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	820	mg/L	24.0	20		04/18/18 16:47	16887-00-6	
Fluoride	ND	mg/L	0.050	1		04/17/18 18:25	16984-48-8	
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	500	100		04/21/18 02:03		D3
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/22/18 15:11	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/13/18 17:21		FS
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	0.18	mg/L	0.010	1		05/02/18 09:45		
350.1 Ammonia, Undistilled	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	95.2	mg/L	4.0	40		04/24/18 11:19	7664-41-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sample: TS-SB-08								
Lab ID: 10427352003								
Collected: 04/13/18 15:20 Received: 04/13/18 16:35 Matrix: Water								
353.2 Nitrate + Nitrite								
Analytical Method: EPA 353.2								
Nitrate as N	ND	mg/L	0.020	1		04/13/18 17:21	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		04/13/18 17:21	14797-65-0	FS
Nitrogen, NO2 plus NO3	ND	mg/L	0.020	1		04/13/18 17:21		FS
9016 Cyanide, Free								
Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/24/18 16:40	04/24/18 17:32		
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	41.3	ug/L	10.0	1	04/23/18 09:55	04/23/18 12:31	57-12-5	
SM4500P-E, Total Phosphorus								
Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B								
Phosphorus	0.096	mg/L	0.050	1	04/26/18 09:33	04/27/18 12:00	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 444328

Analysis Method: EPA 531.1

QC Batch Method: EPA 531.1

Analysis Description: 531.1 HPLC Carbamate

Associated Lab Samples: 10427352003

METHOD BLANK: 2409903

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/03/18 15:06	
Carbofuran	ug/L	ND	2.0	05/03/18 15:06	
BDMC (S)	%	103	80-120	05/03/18 15:06	

LABORATORY CONTROL SAMPLE: 2409904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	10.4	104	80-120	
Carbofuran	ug/L	10	8.8	88	80-120	
BDMC (S)	%			94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409905 2409906

Parameter	Units	35385680001 Result	MS		MSD		MS		MSD		% Rec Limits	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	RPD	RPD				
Aldicarb	ug/L	0.64U	10	10	7.9	9.3	79	93	80-120	16	20	M1		
Carbofuran	ug/L	0.32U	10	10	7.7	8.7	77	87	80-120	12	20	M1		
BDMC (S)	%						47	94	80-120			S0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 441208

Analysis Method: EPA 547

QC Batch Method: EPA 547

Analysis Description: 547 HPLC Glyphosate

Associated Lab Samples: 10427352003

METHOD BLANK: 2394537

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/26/18 20:22	

LABORATORY CONTROL SAMPLE: 2394538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	50.3	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394539 2394540

Parameter	Units	92380797002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	51.6	48.4	103	97	80-120	7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394541 2394542

Parameter	Units	35385315001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<4.2	50	50	52.2	52.2	104	104	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 438905	Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol	Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427352003	

METHOD BLANK: 2027992 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	ug/L	ND	5000	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	ug/L	50000	46800	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Methanol	ug/L	ND	50000	50000	47100	51900	91	101	43-138	10	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 438205	Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol	Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427352003	

METHOD BLANK: 2024704 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/23/18 14:09	

LABORATORY CONTROL SAMPLE: 2024705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	29.3	117	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026734 2026735

Parameter	Units	50194690001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Ethylene glycol	mg/L	ND	25	25	21.9	24.7	87	99	38-154	12	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch:	20643	Analysis Method:	EPA 8316
QC Batch Method:	EPA 8316	Analysis Description:	8316 W GCSV Acrylamide
Associated Lab Samples:	10427352003		

METHOD BLANK: 82388 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/18/18 17:05	

LABORATORY CONTROL SAMPLE: 82389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	989	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 82390 82391

Parameter	Units	10427276001		82391		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Acrylamide	ug/L	ND	1000	1000	944	963	94	96	78-135	2 16

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch:	533449	Analysis Method:	EPA 245.1
QC Batch Method:	EPA 245.1	Analysis Description:	245.1 Mercury - Dissolved
Associated Lab Samples:	10427352001, 10427352002, 10427352003		

METHOD BLANK: 2897827 Matrix: Water

Associated Lab Samples: 10427352001, 10427352002, 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/23/18 17:53	

LABORATORY CONTROL SAMPLE & LCSD: 2897828 2897829

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	4.8	98	96	85-115	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 532437 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10427352001, 10427352002, 10427352003

METHOD BLANK: 2891672 Matrix: Water
Associated Lab Samples: 10427352001, 10427352002, 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/19/18 16:13	
Barium, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Copper, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Manganese, Dissolved	ug/L	ND	5.0	04/19/18 16:13	
Nickel, Dissolved	ug/L	ND	20.0	04/19/18 16:13	
Silver, Dissolved	ug/L	ND	10.0	04/19/18 16:13	
Tin, Dissolved	ug/L	ND	75.0	04/19/18 16:13	
Zinc, Dissolved	ug/L	ND	20.0	04/19/18 16:13	

LABORATORY CONTROL SAMPLE: 2891673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21400	107	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	1020	102	85-115	
Manganese, Dissolved	ug/L	1000	1040	104	85-115	
Nickel, Dissolved	ug/L	1000	1030	103	85-115	
Silver, Dissolved	ug/L	500	506	101	85-115	
Tin, Dissolved	ug/L	1000	1020	102	85-115	
Zinc, Dissolved	ug/L	1000	1040	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891674 2891675

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427032001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21600	21800	108	109	70-130	1	30
Barium, Dissolved	ug/L	ND	1000	1000	1010	1020	100	101	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1050	1050	105	105	70-130	1	30
Manganese, Dissolved	ug/L	8.5	1000	1000	1010	1020	100	101	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	993	997	99	100	70-130	0	30
Silver, Dissolved	ug/L	ND	500	500	506	508	101	102	70-130	0	30
Tin, Dissolved	ug/L	ND	1000	1000	1030	1020	103	101	70-130	1	30
Zinc, Dissolved	ug/L	ND	1000	1000	1030	1030	102	102	70-130	0	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

MATRIX SPIKE SAMPLE: 2893024		10427135002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	ND	20000	23000	115	70-130	
Barium, Dissolved	ug/L	22.2	1000	1080	106	70-130	
Copper, Dissolved	ug/L	ND	1000	1080	108	70-130	
Manganese, Dissolved	ug/L	118	1000	1170	105	70-130	
Nickel, Dissolved	ug/L	ND	1000	1010	100	70-130	
Silver, Dissolved	ug/L	ND	500	532	106	70-130	
Tin, Dissolved	ug/L	ND	1000	1030	103	70-130	
Zinc, Dissolved	ug/L	ND	1000	1010	100	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532878 Analysis Method: EPA 200.8

QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET

Associated Lab Samples: 10427352001, 10427352002, 10427352003

METHOD BLANK: 2894019 Matrix: Water

Associated Lab Samples: 10427352001, 10427352002, 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/19/18 12:18	

LABORATORY CONTROL SAMPLE: 2894020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	108	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2894021 2894022

Parameter	Units	10427405001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chromium	ug/L	0.85	100	100	111	121	111	120	70-130	8	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 533428 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
 Associated Lab Samples: 10427352001, 10427352002, 10427352003

METHOD BLANK: 2897737 Matrix: Water

Associated Lab Samples: 10427352001, 10427352002, 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Arsenic, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Beryllium, Dissolved	ug/L	ND	0.20	04/25/18 08:49	
Boron, Dissolved	ug/L	ND	5.0	04/25/18 08:49	
Cadmium, Dissolved	ug/L	ND	0.080	04/25/18 08:49	
Chromium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Cobalt, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Lead, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Selenium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Thallium, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Uranium-238, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Vanadium, Dissolved	ug/L	ND	1.0	04/25/18 08:49	

LABORATORY CONTROL SAMPLE: 2897738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.4	99	85-115	
Arsenic, Dissolved	ug/L	100	99.4	99	85-115	
Beryllium, Dissolved	ug/L	100	107	107	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	99.0	99	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	102	102	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	101	101	85-115	
Vanadium, Dissolved	ug/L	100	99.6	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739 2897740

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427867001 Result	Spike Conc.	Spike Conc.	MS Result						
Antimony, Dissolved	ug/L	0.0029 mg/L	100	100	110	108	107	105	70-130	2	20
Arsenic, Dissolved	ug/L	ND	100	100	112	109	111	109	70-130	2	20
Beryllium, Dissolved	ug/L	ND	100	100	107	104	107	104	70-130	3	20
Boron, Dissolved	ug/L	32.5	100	100	137	133	104	101	70-130	2	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739												2897740	
Parameter	Units	10427867001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Cadmium, Dissolved	ug/L	ND	100	100	102	101	102	101	70-130	2	20		
Chromium, Dissolved	ug/L	ND	100	100	109	107	109	107	70-130	2	20		
Cobalt, Dissolved	ug/L	3.7	100	100	108	106	104	103	70-130	1	20		
Lead, Dissolved	ug/L	ND	100	100	105	103	105	103	70-130	3	20		
Selenium, Dissolved	ug/L	0.00058 mg/L	100	100	114	111	113	110	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	104	100	104	100	70-130	4	20		
Uranium-238, Dissolved	ug/L	10.3	100	100	118	116	108	106	70-130	2	20		
Vanadium, Dissolved	ug/L	ND	100	100	110	108	110	108	70-130	2	20		

MATRIX SPIKE SAMPLE: 2897741									
Parameter	Units	10427767003	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	105	105	70-130			
Arsenic, Dissolved	ug/L	ND	100	106	106	70-130			
Beryllium, Dissolved	ug/L	ND	100	115	115	70-130			
Boron, Dissolved	ug/L	11.5	100	124	113	70-130			
Cadmium, Dissolved	ug/L	ND	100	104	104	70-130			
Chromium, Dissolved	ug/L	ND	100	109	109	70-130			
Cobalt, Dissolved	ug/L	ND	100	110	110	70-130			
Lead, Dissolved	ug/L	ND	100	110	110	70-130			
Selenium, Dissolved	ug/L	ND	100	109	109	70-130			
Thallium, Dissolved	ug/L	ND	100	109	109	70-130			
Uranium-238, Dissolved	ug/L	ND	100	108	108	70-130			
Vanadium, Dissolved	ug/L	ND	100	107	107	70-130			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532754 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10427352003

METHOD BLANK: 2893227 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/17/18 11:21	
1,2-Dichloroethane-d4 (S)	%.	102	75-125	04/17/18 11:21	
4-Bromofluorobenzene (S)	%.	97	75-125	04/17/18 11:21	
Toluene-d8 (S)	%.	96	75-125	04/17/18 11:21	

LABORATORY CONTROL SAMPLE: 2893228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	77.9	97	70-130	
1,2-Dichloroethane-d4 (S)	%.			103	75-125	
4-Bromofluorobenzene (S)	%.			95	75-125	
Toluene-d8 (S)	%.			97	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897401 2897402

Parameter	Units	10427958001		2897402		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	73.3	82.0	92	103	70-130	11	20
1,2-Dichloroethane-d4 (S)	%.						104	104	75-125		
4-Bromofluorobenzene (S)	%.						97	96	75-125		
Toluene-d8 (S)	%.						96	95	75-125		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 441140 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10427352003

METHOD BLANK: 2394100 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/19/18 21:45	

LABORATORY CONTROL SAMPLE: 2394101

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	45.7	91	64-137	

LABORATORY CONTROL SAMPLE: 2394102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	7.4J	82	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395124 2395125

Parameter	Units	35386626001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Endothall	ug/L	4.3U	50	50	49.5	48.1	99	96	64-137	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2395126 2395127

Parameter	Units	35386626002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Endothall	ug/L	4.3U	50	50	20.6	22.1	41	44	64-137	7	30 M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 440817 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10427352003

METHOD BLANK: 2392537 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/18/18 19:40	
Paraquat	ug/L	ND	0.40	04/18/18 19:40	

LABORATORY CONTROL SAMPLE: 2392538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	2.1	103	70-130	
Paraquat	ug/L	2	1.7	85	70-130	

LABORATORY CONTROL SAMPLE: 2392539

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.58	144	50-150	
Paraquat	ug/L	.4	ND	75	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393245 2393246

Parameter	Units	35386136002 Result	MS Spike Conc.	MSD Spike Conc.	2393245		2393246		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	0.30U	2	2	ND	ND	0	0	70-130		30 M1	
Paraquat	ug/L	0.30U	2	2	ND	ND	0	0	70-130		30 M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393247 2393248

Parameter	Units	35386336001 Result	MS Spike Conc.	MSD Spike Conc.	2393247		2393248		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	0.30U	2	2	1.9	2.1	96	103	70-130	7	30	
Paraquat	ug/L	0.30U	2	2	1.9	1.9	95	94	70-130	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 441812 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10427352003

METHOD BLANK: 2397907 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Dichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/25/18 15:02	
Monobromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Monochloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Trichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
2,3-Dibromopropanoic Acid (S)	%	115	70-130	04/25/18 15:02	

LABORATORY CONTROL SAMPLE: 2397908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	12.4	124	70-130	
Dichloroacetic Acid	ug/L	10	10.5	105	70-130	
Haloacetic Acids (Total)	ug/L	50	55.7	111	70-130	
Monobromoacetic Acid	ug/L	10	10.8	108	70-130	
Monochloroacetic Acid	ug/L	10	10.9	109	70-130	
Trichloroacetic Acid	ug/L	10	11.1	111	70-130	
2,3-Dibromopropanoic Acid (S)	%			123	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398523 2398524

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.75J	10	10	13.2	12.5	125	117	70-130	6	30	
Dichloroacetic Acid	ug/L	28.5	10	10	40.3	37.2	119	87	70-130	8	30	
Haloacetic Acids (Total)	ug/L	33.1	50	50	93.8	88.0	121	110	70-130	6	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	11.0	11.5	110	115	70-130	5	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	13.7	12.1	137	121	70-130	12	30	M1
Trichloroacetic Acid	ug/L	3.9	10	10	15.6	14.7	117	109	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						136	114	70-130		30	S0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398525 2398526

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.76J	10	10	12.5	12.9	117	122	70-130	4	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Parameter	Units	35386593002		2398525		2398526		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result							
Dichloroacetic Acid	ug/L	28.5	10	10	36.8	36.9	83	84	70-130	0	30			
Haloacetic Acids (Total)	ug/L	33.2	50	50	85.7	87.0	105	108	70-130	2	30			
Monobromoacetic Acid	ug/L	0.29U	10	10	10.9	10.5	109	105	70-130	4	30			
Monochloroacetic Acid	ug/L	0.90U	10	10	11.5	12.0	115	120	70-130	4	30			
Trichloroacetic Acid	ug/L	3.9	10	10	14.0	14.7	101	108	70-130	5	30			
2,3-Dibromopropanoic Acid (S)	%						110	116	70-130		30			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 534073

Analysis Method: EPA 8011

QC Batch Method: EPA 8011

Analysis Description: GCS 8011 EDB DBCP

Associated Lab Samples: 10427352003

METHOD BLANK: 2901365

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%.	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

2901367

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%.				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532721

Analysis Method: EPA 8081B

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8081B GCS Pesticides

Associated Lab Samples: 10427352003

METHOD BLANK: 2893117

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/19/18 21:40	
4,4'-DDE	ug/L	ND	0.10	04/19/18 21:40	
4,4'-DDT	ug/L	ND	0.10	04/19/18 21:40	
Aldrin	ug/L	ND	0.050	04/19/18 21:40	
alpha-BHC	ug/L	ND	0.050	04/19/18 21:40	
alpha-Chlordane	ug/L	ND	0.050	04/19/18 21:40	
beta-BHC	ug/L	ND	0.050	04/19/18 21:40	
Chlordane (Technical)	ug/L	ND	0.50	04/19/18 21:40	
delta-BHC	ug/L	ND	0.050	04/19/18 21:40	
Dieldrin	ug/L	ND	0.10	04/19/18 21:40	
Endosulfan I	ug/L	ND	0.050	04/19/18 21:40	
Endosulfan II	ug/L	ND	0.10	04/19/18 21:40	
Endosulfan sulfate	ug/L	ND	0.10	04/19/18 21:40	
Endrin	ug/L	ND	0.10	04/19/18 21:40	
Endrin aldehyde	ug/L	ND	0.10	04/19/18 21:40	
Endrin ketone	ug/L	ND	0.10	04/19/18 21:40	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/19/18 21:40	
gamma-Chlordane	ug/L	ND	0.050	04/19/18 21:40	
Heptachlor	ug/L	ND	0.050	04/19/18 21:40	
Heptachlor epoxide	ug/L	ND	0.050	04/19/18 21:40	
Methoxychlor	ug/L	ND	0.50	04/19/18 21:40	
Toxaphene	ug/L	ND	1.5	04/19/18 21:40	
Decachlorobiphenyl (S)	%	79	30-143	04/19/18 21:40	
Tetrachloro-m-xylene (S)	%	91	62-125	04/19/18 21:40	

LABORATORY CONTROL SAMPLE & LCSD: 2893118

2893119

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
4,4'-DDD	ug/L	1	0.99	0.96	99	96	67-125	3	20	
4,4'-DDE	ug/L	1	0.97	0.93	97	93	68-125	4	20	
4,4'-DDT	ug/L	1	0.92	0.89	92	89	66-125	3	20	
Aldrin	ug/L	.5	0.44	0.39	87	79	46-125	10	20	
alpha-BHC	ug/L	.5	0.49	0.48	98	95	66-125	3	20	
alpha-Chlordane	ug/L	.5	0.48	0.46	96	92	72-125	4	20	
beta-BHC	ug/L	.5	0.49	0.47	97	94	72-125	3	20	
delta-BHC	ug/L	.5	0.40	0.39	81	78	37-141	4	20	
Dieldrin	ug/L	1	1.1	1.0	106	103	71-125	3	20	
Endosulfan I	ug/L	.5	0.47	0.45	94	91	69-125	3	20	
Endosulfan II	ug/L	1	1.0	0.99	102	99	73-125	3	20	
Endosulfan sulfate	ug/L	1	0.90	0.88	90	88	63-127	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

LABORATORY CONTROL SAMPLE & LCSD: 2893118		2893119									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Endrin	ug/L	1	0.97	0.95	97	95	72-125	2	20		
Endrin aldehyde	ug/L	1	0.97	0.95	97	95	70-125	2	20		
Endrin ketone	ug/L	1	1.0	1.0	103	101	72-127	2	20		
gamma-BHC (Lindane)	ug/L	.5	0.49	0.48	98	95	69-125	3	20		
gamma-Chlordane	ug/L	.5	0.43	0.41	86	83	64-125	4	20		
Heptachlor	ug/L	.5	0.48	0.45	96	90	54-125	7	20		
Heptachlor epoxide	ug/L	.5	0.49	0.47	97	94	72-125	3	20		
Methoxychlor	ug/L	5	4.7	4.6	94	92	67-127	2	20		
Decachlorobiphenyl (S)	%				82	74	30-143				
Tetrachloro-m-xylene (S)	%				95	91	62-125				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532722	Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C	Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427352003	

METHOD BLANK: 2893120 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/18/18 13:15	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/18/18 13:15	
Decachlorobiphenyl (S)	%	72	30-125	04/18/18 13:15	
Tetrachloro-m-xylene (S)	%	63	30-125	04/18/18 13:15	

LABORATORY CONTROL SAMPLE & LCSD: 2893121 2893122

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.6	78	79	47-125	1	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.7	1.7	83	85	54-125	3	20	
Decachlorobiphenyl (S)	%				82	83	30-125			
Tetrachloro-m-xylene (S)	%				66	67	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532581

Analysis Method: EPA 8270D

QC Batch Method: EPA 3520

Analysis Description: 8270D Water MSSV

Associated Lab Samples: 10427352003

METHOD BLANK: 2892635

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2,4-Dichlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2,4-Dimethylphenol	ug/L	ND	50.0	04/20/18 13:29	
2,4-Dinitrophenol	ug/L	ND	10.0	04/20/18 13:29	
2-Chlorophenol	ug/L	ND	10.0	04/20/18 13:29	
2-Methylnaphthalene	ug/L	ND	10.0	04/20/18 13:29	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/20/18 13:29	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/20/18 13:29	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/20/18 13:29	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/20/18 13:29	
Acenaphthene	ug/L	ND	10.0	04/20/18 13:29	
Anthracene	ug/L	ND	10.0	04/20/18 13:29	
Benzo(a)pyrene	ug/L	ND	10.0	04/20/18 13:29	
Benzoic acid	ug/L	ND	50.0	04/20/18 13:29	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/20/18 13:29	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/20/18 13:29	
Butylbenzylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Di-n-butylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Di-n-octylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Diethylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Dimethylphthalate	ug/L	ND	10.0	04/20/18 13:29	
Fluoranthene	ug/L	ND	10.0	04/20/18 13:29	
Fluorene	ug/L	ND	10.0	04/20/18 13:29	
Hexachlorobenzene	ug/L	ND	10.0	04/20/18 13:29	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/20/18 13:29	
Hexachloroethane	ug/L	ND	10.0	04/20/18 13:29	
Isophorone	ug/L	ND	10.0	04/20/18 13:29	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/20/18 13:29	
Pentachlorophenol	ug/L	ND	20.0	04/20/18 13:29	
Phenanthrene	ug/L	ND	10.0	04/20/18 13:29	
Phenol	ug/L	ND	10.0	04/20/18 13:29	
Pyrene	ug/L	ND	10.0	04/20/18 13:29	
2,4,6-Tribromophenol (S)	%	86	65-125	04/20/18 13:29	
2-Fluorobiphenyl (S)	%	72	56-125	04/20/18 13:29	
2-Fluorophenol (S)	%	71	55-125	04/20/18 13:29	
Nitrobenzene-d5 (S)	%	71	60-125	04/20/18 13:29	
p-Terphenyl-d14 (S)	%	92	58-125	04/20/18 13:29	
Phenol-d6 (S)	%	72	58-125	04/20/18 13:29	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

LABORATORY CONTROL SAMPLE & LCSD: 2892636		2892637									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	45.9	45.1	92	90	74-125	2	20		
2,4-Dichlorophenol	ug/L	50	46.6	43.2	93	86	68-125	8	20		
2,4-Dimethylphenol	ug/L	50	40.9J	35.4J	82	71	33-125		20		
2,4-Dinitrophenol	ug/L	50	41.2	42.6	82	85	30-127	3	20		
2-Chlorophenol	ug/L	50	44.4	40.1	89	80	61-125	10	20		
2-Methylnaphthalene	ug/L	50	44.6	41.2	89	82	67-125	8	20		
2-Methylphenol(o-Cresol)	ug/L	50	43.3	39.6	87	79	63-125	9	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	44.7	40.9	89	82	67-125	9	20		
3,3'-Dichlorobenzidine	ug/L	50	54.7	50.0	109	100	60-125	9	20		
4-Bromophenylphenyl ether	ug/L	50	45.6	45.8	91	92	75-125	0	20		
Acenaphthene	ug/L	50	43.7	43.7	87	87	74-125	0	20		
Anthracene	ug/L	50	44.4	44.9	89	90	75-125	1	20		
Benzo(a)pyrene	ug/L	50	46.8	47.3	94	95	75-125	1	20		
Benzoic acid	ug/L	50	19.8J	30.9J	40	62	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	40.2	36.8	80	74	55-125	9	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	55.5	52.7	111	105	72-129	5	20		
Butylbenzylphthalate	ug/L	50	52.7	51.2	105	102	69-127	3	20		
Di-n-butylphthalate	ug/L	50	49.3	49.3	99	99	75-125	0	20		
Di-n-octylphthalate	ug/L	50	56.2	54.2	112	108	69-131	4	20		
Diethylphthalate	ug/L	50	47.4	47.7	95	95	75-125	1	20		
Dimethylphthalate	ug/L	50	47.5	47.6	95	95	75-125	0	20		
Fluoranthene	ug/L	50	45.8	46.9	92	94	75-125	2	20		
Fluorene	ug/L	50	45.1	45.6	90	91	75-125	1	20		
Hexachlorobenzene	ug/L	50	46.9	47.3	94	95	74-125	1	20		
Hexachlorocyclopentadiene	ug/L	50	23.4J	19J	47	38	30-125		20		
Hexachloroethane	ug/L	50	38.5	35.5	77	71	30-125	8	20		
Isophorone	ug/L	50	44.5	40.9	89	82	72-125	8	20		
N-Nitrosodiphenylamine	ug/L	50	46.1	46.3	92	93	75-125	0	20		
Pentachlorophenol	ug/L	50	40.0	40.3	80	81	52-125	1	20		
Phenanthrene	ug/L	50	44.0	45.0	88	90	75-125	2	20		
Phenol	ug/L	50	41.9	38.1	84	76	59-125	9	20		
Pyrene	ug/L	50	49.5	49.1	99	98	75-125	1	20		
2,4,6-Tribromophenol (S)	%				94	93	65-125				
2-Fluorobiphenyl (S)	%				80	77	56-125				
2-Fluorophenol (S)	%				79	72	55-125				
Nitrobenzene-d5 (S)	%				79	72	60-125				
p-Terphenyl-d14 (S)	%				97	95	58-125				
Phenol-d6 (S)	%				79	72	58-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 533322 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10427352001, 10427352002

METHOD BLANK: 2897016 Matrix: Water

Associated Lab Samples: 10427352001, 10427352002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dimethylphenol	ug/L	ND	50.0	04/23/18 13:12	
2,4-Dinitrophenol	ug/L	ND	10.0	04/23/18 13:12	
2-Chlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/23/18 13:12	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/23/18 13:12	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/23/18 13:12	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthene	ug/L	ND	10.0	04/23/18 13:12	
Anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Benzoic acid	ug/L	ND	50.0	04/23/18 13:12	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/23/18 13:12	
Butylbenzylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Di-n-butylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Di-n-octylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Diethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dimethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Fluorene	ug/L	ND	10.0	04/23/18 13:12	
Hexachlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/23/18 13:12	
Hexachloroethane	ug/L	ND	10.0	04/23/18 13:12	
Isophorone	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/23/18 13:12	
Pentachlorophenol	ug/L	ND	20.0	04/23/18 13:12	
Phenanthrene	ug/L	ND	10.0	04/23/18 13:12	
Phenol	ug/L	ND	10.0	04/23/18 13:12	
Pyrene	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Tribromophenol (S)	%	100	65-125	04/23/18 13:12	
2-Fluorobiphenyl (S)	%	85	56-125	04/23/18 13:12	
2-Fluorophenol (S)	%	90	55-125	04/23/18 13:12	
Nitrobenzene-d5 (S)	%	87	60-125	04/23/18 13:12	
p-Terphenyl-d14 (S)	%	105	58-125	04/23/18 13:12	
Phenol-d6 (S)	%	91	58-125	04/23/18 13:12	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

LABORATORY CONTROL SAMPLE & LCSD: 2897017			2897018							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	47.6	46.1	95	92	74-125	3	20	
2,4-Dichlorophenol	ug/L	50	46.2	45.8	92	92	68-125	1	20	
2,4-Dimethylphenol	ug/L	50	36.7J	33.2J	73	66	33-125		20	
2,4-Dinitrophenol	ug/L	50	44.2	49.6	88	99	30-127	12	20	
2-Chlorophenol	ug/L	50	42.5	40.8	85	82	61-125	4	20	
2-Methylnaphthalene	ug/L	50	45.8	43.0	92	86	67-125	6	20	
2-Methylphenol(o-Cresol)	ug/L	50	43.3	40.4	87	81	63-125	7	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.9	42.1	88	84	67-125	4	20	
3,3'-Dichlorobenzidine	ug/L	50	55.6	52.5	111	105	60-125	6	20	
4-Bromophenylphenyl ether	ug/L	50	48.0	46.6	96	93	75-125	3	20	
Acenaphthene	ug/L	50	47.1	45.3	94	91	74-125	4	20	
Anthracene	ug/L	50	48.4	46.0	97	92	75-125	5	20	
Benzo(a)pyrene	ug/L	50	48.6	47.8	97	96	75-125	2	20	
Benzoic acid	ug/L	50	28.6J	32.3J	57	65	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	39.9	37.8	80	76	55-125	5	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	55.2	54.2	110	108	72-129	2	20	
Butylbenzylphthalate	ug/L	50	54.4	51.4	109	103	69-127	6	20	
Di-n-butylphthalate	ug/L	50	53.2	50.5	106	101	75-125	5	20	
Di-n-octylphthalate	ug/L	50	56.1	54.8	112	110	69-131	2	20	
Diethylphthalate	ug/L	50	50.4	49.0	101	98	75-125	3	20	
Dimethylphthalate	ug/L	50	50.6	49.1	101	98	75-125	3	20	
Fluoranthene	ug/L	50	50.0	48.2	100	96	75-125	4	20	
Fluorene	ug/L	50	47.8	46.5	96	93	75-125	3	20	
Hexachlorobenzene	ug/L	50	49.3	47.2	99	94	74-125	4	20	
Hexachlorocyclopentadiene	ug/L	50	19.6J	ND	39	33	30-125		20	
Hexachloroethane	ug/L	50	42.8	40.0	86	80	30-125	7	20	
Isophorone	ug/L	50	45.7	42.8	91	86	72-125	7	20	
N-Nitrosodiphenylamine	ug/L	50	49.5	47.5	99	95	75-125	4	20	
Pentachlorophenol	ug/L	50	42.8	40.6	86	81	52-125	5	20	
Phenanthrene	ug/L	50	47.3	45.6	95	91	75-125	4	20	
Phenol	ug/L	50	41.4	40.1	83	80	59-125	3	20	
Pyrene	ug/L	50	50.4	49.0	101	98	75-125	3	20	
2,4,6-Tribromophenol (S)	%				95	91	65-125			
2-Fluorobiphenyl (S)	%				80	74	56-125			
2-Fluorophenol (S)	%				76	72	55-125			
Nitrobenzene-d5 (S)	%				77	72	60-125			
p-Terphenyl-d14 (S)	%				95	92	58-125			
Phenol-d6 (S)	%				76	73	58-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch:	20633	Analysis Method:	EPA 8315A
QC Batch Method:	EPA 8315A	Analysis Description:	8315 GCSV Aldehydes
Associated Lab Samples:	10427352003		

METHOD BLANK: 82358 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/19/18 15:47	

LABORATORY CONTROL SAMPLE: 82359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	380	95	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 82485 82486

Parameter	Units	10427276001		82486		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Formaldehyde	ug/L	ND	400	400	527	399	130	98	35-167	28	20 H3,R1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532263	Analysis Method: Hach 10360 Rev 1.1
QC Batch Method: Hach 10360	Analysis Description: Hach 10360 Rev 1.1, BOD
Associated Lab Samples: 10427352003	

METHOD BLANK: 2890529 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/18/18 15:52	

LABORATORY CONTROL SAMPLE: 2890531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	205	104	85-115	

SAMPLE DUPLICATE: 2890532

Parameter	Units	10427086001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	120 U	ND		20	B2

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 534191	Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG	Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10427352003	

METHOD BLANK: 2902447 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/25/18 09:37	

LABORATORY CONTROL SAMPLE: 2902448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	37.9	95	78-114	

MATRIX SPIKE SAMPLE: 2902449

Parameter	Units	10427228001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	<1.1	40	27.7	67	78-114	M1

SAMPLE DUPLICATE: 2902450

Parameter	Units	10428140001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	4.8	3.6J		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532382

Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1

Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10427352003

METHOD BLANK: 2891524

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/14/18 14:46	

LABORATORY CONTROL SAMPLE: 2891525

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.4	102	90-110	

SAMPLE DUPLICATE: 2891526

Parameter	Units	10427352003 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	260	259	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 533468 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10427352003

METHOD BLANK: 2897880 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/20/18 11:12	

LABORATORY CONTROL SAMPLE: 2897881

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	88.0	88	80-120	

SAMPLE DUPLICATE: 2897882

Parameter	Units	10427360001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	419	381	10	10	

SAMPLE DUPLICATE: 2897883

Parameter	Units	10427457001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	212	206	3	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 442752	Analysis Method: SM 4500-CIO2
QC Batch Method: SM 4500-CIO2	Analysis Description: 4500CIO2 Chlorine Dioxide
Associated Lab Samples: 10427352003	

METHOD BLANK: 2402049 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/25/18 13:30	H6

LABORATORY CONTROL SAMPLE: 2402050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	95	90-110	H6

SAMPLE DUPLICATE: 2402051

Parameter	Units	10427276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	1.6	1.6	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 534050 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10427352003

LABORATORY CONTROL SAMPLE: 2901275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2901276

Parameter	Units	10427998001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.6	6.6	0	3	H6

SAMPLE DUPLICATE: 2901277

Parameter	Units	10428020002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	12.0	12.0	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

QC Batch: 532702 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10427352003

METHOD BLANK: 2893078 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/17/18 09:44	
Fluoride	mg/L	ND	0.050	04/17/18 09:44	

LABORATORY CONTROL SAMPLE: 2893079

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	98	90-110	
Fluoride	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893080 2893081

Parameter	Units	10427348003 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	4.3	12.5	12.5	15.8	16.1	92	94	90-110	2	20	
Fluoride	mg/L	0.32	1	1	1.1	1.1	75	77	90-110	2	20 M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2893082 2893083

Parameter	Units	10427276001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	56.5	12.5	12.5	58.2	59.0	13	20	90-110	1	20 M1	
Fluoride	mg/L	0.14	1	1	0.99	1.0	86	87	90-110	1	20 M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 441891	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427352003	

METHOD BLANK: 2398224 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/20/18 16:36	

LABORATORY CONTROL SAMPLE: 2398225

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	38.9	97	85-115	

MATRIX SPIKE SAMPLE: 2398227

Parameter	Units	35387332001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	128U	2000	1910	96	75-125	

SAMPLE DUPLICATE: 2398226

Parameter	Units	35387332001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	128U	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 442024	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427352003	

METHOD BLANK: 2399130 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	8.1	101	85-115	

MATRIX SPIKE SAMPLE: 2399133

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	77.2	97	75-125	

SAMPLE DUPLICATE: 2399132

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532346	Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10427352003	

METHOD BLANK: 2891044 Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/13/18 16:43	FS

LABORATORY CONTROL SAMPLE: 2891045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.20	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891046 2891047

Parameter	Units	2891046		2891047		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10427276001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium, Hexavalent	mg/L	0.011	.2	.2	0.012	0.012	1	1	85-115	0	20	FS,H1,M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 141155

Analysis Method: EPA 350.1

QC Batch Method: EPA 350.1

Analysis Description: 350.1 Ammonia Undistilled

Associated Lab Samples: 10427352003

METHOD BLANK: 558427

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/24/18 09:49	

LABORATORY CONTROL SAMPLE: 558428

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2	2.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 558429 558430

Parameter	Units	12107084001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	2	2	2.0	2.0	98	100	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 558431 558432

Parameter	Units	12107225001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	2	2	2.0	2.0	99	102	90-110	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 532358

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10427352003

METHOD BLANK: 2891118

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/13/18 17:20	FS
Nitrite as N	mg/L	ND	0.020	04/13/18 17:20	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/13/18 17:20	FS

LABORATORY CONTROL SAMPLE: 2891119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	102	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891120 2891121

Parameter	Units	10427206001		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result						
Nitrite as N	mg/L	0.020 U	1	1	0.97	1.0	97	101	90-110	4	20		
Nitrogen, NO2 plus NO3	mg/L	4.5	5	5	9.9	9.7	109	105	90-110	2	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2891122 2891123

Parameter	Units	10427206006		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result						
Nitrite as N	mg/L	0.020 U	1	1	0.97	1.0	96	102	90-110	6	20		
Nitrogen, NO2 plus NO3	mg/L	30.2	20	20	49.2	50.0	95	99	90-110	2	20 E		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch:	21104	Analysis Method:	EPA 9016
QC Batch Method:	EPA 9016	Analysis Description:	9016 Free Cyanide
Associated Lab Samples:	10427352003		

METHOD BLANK: 84163 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/24/18 17:31	

LABORATORY CONTROL SAMPLE: 84164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	148	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84165 84166

Parameter	Units	10427352003		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Cyanide, Free	ug/L	ND	150	150	142	143	95	95	80-120	1	11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 533717 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10427352003

METHOD BLANK: 2899085 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/23/18 12:02	

LABORATORY CONTROL SAMPLE: 2899086

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	246	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899087 2899088

Parameter	Units	10427113002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	ND	250	250	226	235	88	91	80-120	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2899089 2899090

Parameter	Units	10427114001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	10.5	250	250	242	240	92	92	80-120	1	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 534444	Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B	Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10427352003	

METHOD BLANK: 2903593 Matrix: Water
Associated Lab Samples: 10427352003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/27/18 12:18	

LABORATORY CONTROL SAMPLE: 2903594

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903595 2903596

Parameter	Units	10428297001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.068	1	1	1.0	1.1	98	101	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903597 2903598

Parameter	Units	10428298001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.098	1	1	1.1	1.1	99	100	80-120	1	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Sample: TS-SB-08 **Lab ID: 10427352003** Collected: 04/13/18 15:20 Received: 04/13/18 16:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	13.3 ± 9.42 (15.4) C:NA T:NA	pCi/L	05/02/18 18:41	12587-46-1	
Gross Beta	EPA 900.0	98.0 ± 19.5 (9.43) C:NA T:NA	pCi/L	05/02/18 18:41	12587-47-2	
Radium-226	EPA 903.1	0.119 ± 0.403 (0.779) C:NA T:91%	pCi/L	05/01/18 19:18	13982-63-3	
Radium-228	EPA 904.0	0.991 ± 0.456 (0.764) C:82% T:72%	pCi/L	05/03/18 11:04	15262-20-1	
Total Radium	Total Radium Calculation	1.11 ± 0.859 (1.54)	pCi/L	05/07/18 12:58	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 295481

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10427352003

METHOD BLANK: 1446558

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.261 ± 0.405 (0.702) C:NA T:87%	pCi/L	05/01/18 18:48	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch: 295494

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10427352003

METHOD BLANK: 1446590

Matrix: Water

Associated Lab Samples: 10427352003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.378 ± 0.342 (0.697) C:82% T:92%	pCi/L	05/03/18 11:03	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

QC Batch:	296415	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10427352003		

METHOD BLANK:	1451259	Matrix:	Water
Associated Lab Samples:	10427352003		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.056 ± 0.549 (1.49) C:NA T:NA	pCi/L	05/03/18 08:27	
Gross Beta	0.198 ± 0.729 (1.74) C:NA T:NA	pCi/L	05/03/18 08:27	

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427352

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 532999

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

BATCH QUALIFIERS

Batch: 533100

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533817

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533882

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534191

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

- 1M Sample pH adjusted using 6mL 6N HCl.
- 2M Sample was yellow in color. Emulsion was also present during extraction.
- B2 Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- E Analyte concentration exceeded the calibration range. The reported result is estimated.
- FS The sample was filtered in the laboratory prior to analysis.
- H1 Analysis conducted outside the recognized method holding time.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- IO The internal standard response was outside the laboratory acceptance limits confirmed by reanalysis. The results reported are from the most QC compliant analysis.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S3 Surrogate recovery exceeded laboratory control limits. Analyte presence below reporting limits in associated samples.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10427352

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427352003	TS-SB-08				
10427352003	TS-SB-08	EPA 531.1	444328		
10427352003	TS-SB-08	EPA 547	441208		
10427352003	TS-SB-08	EPA 549.2	440817	EPA 549.2	441186
10427352003	TS-SB-08	EPA 552.3	441812	EPA 552.3	442081
10427352003	TS-SB-08	EPA 8011	534073	EPA 8011	534336
10427352003	TS-SB-08	EPA 8015 Alcohol-Glycol	438905		
10427352003	TS-SB-08	EPA 8015 Alcohol-Glycol	438205		
10427352003	TS-SB-08	EPA Mod. 3510C	532721	EPA 8081B	533100
10427352003	TS-SB-08	EPA Mod. 3510C	532722	EPA 8082A	532999
10427352003	TS-SB-08	EPA 8315A	20633	EPA 8315A	20789
10427352003	TS-SB-08	EPA 8316	20643		
10427352001	TS-SB-05	EPA 200.7	532437	EPA 200.7	532779
10427352002	TS-SB-07	EPA 200.7	532437	EPA 200.7	532779
10427352003	TS-SB-08	EPA 200.7	532437	EPA 200.7	532779
10427352001	TS-SB-05	EPA 200.8	532878	EPA 200.8	533104
10427352002	TS-SB-07	EPA 200.8	532878	EPA 200.8	533104
10427352003	TS-SB-08	EPA 200.8	532878	EPA 200.8	533104
10427352001	TS-SB-05	EPA 200.8	533428	EPA 200.8	533889
10427352002	TS-SB-07	EPA 200.8	533428	EPA 200.8	533889
10427352003	TS-SB-08	EPA 200.8	533428	EPA 200.8	533889
10427352001	TS-SB-05	EPA 245.1	533449	EPA 245.1	533882
10427352002	TS-SB-07	EPA 245.1	533449	EPA 245.1	533882
10427352003	TS-SB-08	EPA 245.1	533449	EPA 245.1	533882
10427352003	TS-SB-08	EPA 548.1	441140	EPA 548.1	441552
10427352001	TS-SB-05	EPA 3520	533322	EPA 8270D	533817
10427352002	TS-SB-07	EPA 3520	533322	EPA 8270D	533817
10427352003	TS-SB-08	EPA 3520	532581	EPA 8270D	532989
10427352003	TS-SB-08	EPA 524.2	532754		
10427352003	TS-SB-08				
10427352003	TS-SB-08	EPA 900.0	296415		
10427352003	TS-SB-08	EPA 903.1	295481		
10427352003	TS-SB-08	EPA 904.0	295494		
10427352003	TS-SB-08	Total Radium Calculation	297265		
10427352003	TS-SB-08	Hach 10360	532263	Hach 10360 Rev 1.1	532509
10427352003	TS-SB-08	EPA 1664A OG	534191		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10427352

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427352003	TS-SB-08	EPA 180.1	532382		
10427352003	TS-SB-08	SM 2540D	533468		
10427352003	TS-SB-08	SM 4500-CIO2	442752		
10427352003	TS-SB-08	SM 4500-H+B	534050		
10427352003	TS-SB-08	Trivalent Chromium Calculation	534084		
10427352003	TS-SB-08	EPA 300.0	532702		
10427352003	TS-SB-08	EPA 300.1	441891		
10427352003	TS-SB-08	EPA 300.1	442023		
10427352003	TS-SB-08	EPA 300.1	441890		
10427352003	TS-SB-08	EPA 300.1	442024		
10427352003	TS-SB-08	SM 3500-Cr B Modified	532346		
10427352003	TS-SB-08	EPA 350.1			
10427352003	TS-SB-08	EPA 350.1	141155		
10427352003	TS-SB-08	EPA 353.2	532358		
10427352003	TS-SB-08	EPA 9016	21104	EPA 9016	21181
10427352003	TS-SB-08	SM 4500-CN-E	533717	SM 4500-CN-E	533784
10427352003	TS-SB-08	SM 4500-P B	534444	SM 4500-P E	534526

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WO#: 10427352



10427352

Minnesota Pollution Control Agency		Work Order Number: 10427352		COC Type: 18-00383		Page: 1 of 1								
PROJECT/CLIENT INFO				LABORATORY										
Facility Code: MPCA Freeway LF Waters		Program Code (MDH Lab Only):		Lab Name:		FOR LAB USE ONLY								
Project Name: MPCA Freeway LF Waters		Project Task Code:		Address: 18-00383		Lab Work Order Sticker								
Project Manager:		Potential Hazard? If yes, add information to Sampler Comments Section		Phone No:		EPIC Profile # 38716								
SAMPLE DETAILS				ANALYSIS REQUESTED										
SAMPLE TYPE CODES S=Routine Sample S-IVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air BL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES Ww-Ground=Groundwater Ww-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample								
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	Lab Sample No.	#
TS-SB-05	S	4/13/18	1120			G	NW	WTF - Ground			3	XX	001	1
TS-SB-07	S	4/13/18	1330			G	NW	WTF - Ground			3	XX	002	2
TS-SB-08	S	4/13/18	1520			G	NW	WTF - Ground			41	X	003	3
														4
														5
														6
														7
														8
														9
														10
Sampled By: Dave Anderson / David Anderson		Sampler's Signature: Dave Anderson		Phone #:										
Receiving Comments:		Relinquished By/Affiliation		Date/Time		Accepted By/Affiliation		Date/Time						
		Dave Anderson / Pace Analytical		4/13/18 / 1630		PACE		4-13-18 / 1635						

TS-SB-05 collected only 250 HNO3 filtered / 250 HNO3 unfiltered / (1) glass liter
 TS-SB-07 collected only 250 HNO3 filtered / 250 HNO3 unfiltered / (1) glass liter

T = 9.6^②
 3.8
 9.1

Sample Condition Upon Receipt **Client Name:** MN Pollution Agency **Project #:** _____

Courier: Fed Ex UPS USPS Client 4/13/18

Commercial Pace SpeeDee Other: _____

Tracking Number: _____

WO# : 10427352

PM: JMA **Due Date: 04/27/18**

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted

Used: G87A9155100842 **Correction Factor:** +0.2

Cooler Temp Read (°C): 9.4, 3.6, 8.9 **Cooler Temp Corrected (°C):** 9.6, 3.8, 9.1 **Biological Tissue Frozen?** Yes No N/A

Temp should be above freezing to 6°C **Date and Initials of Person Examining Contents:** 4/13/18

USDA Regulated Soil N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>SEE EXCEPTIONS</u>
-Includes Date/Time/ID/Analysis Matrix: <u>not</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>SEE EXCEPTIONS</u>
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: Brad Jacobson **Date/Time:** _____

Comments/Resolution: Confirmed that 8270 SVOC should be analyzed on AGIU containers received for samples TS-SB-05 10427352-001) and TS-SB-07 (10427352-002). Extra sample received is a vial from the Cyanide kit for sample TS-SB-08 (10427352-003)

Project Manager Review: [Signature] **Date:** 04/17/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace



Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

Workorder: 10427352 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To				Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				Nitrogen, unionized ammonia, as N															
						LAB USE ONLY															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				H2SO4	Nitrogen, unionized ammonia, as N										
1	TS-SB-08	PS	4/13/2018 15:20	10427352003	Water	1					X										
2																					
3																					
4																					
5																					
Transfers											Comments										
Released By	Date/Time	Received By	Date/Time																		
<i>Pract</i>	4/16/18 1745	<i>CB</i>	4/16/18 1745	returning volume to																	
<i>CB</i>	4/16/18 2130	<i>B. Matthews</i>	4/17/18 0900	MPLS																	
<i>R. Clapp</i>	4-25-18 1830	<i>Mark Lane</i>	4/25/18 1830																		
Cooler Temperature on Receipt		5.6 °C	Custody Seal		<input checked="" type="checkbox"/> Y or N	Received on Ice		<input checked="" type="checkbox"/> Y or N	Samples Intact										<input checked="" type="checkbox"/> Y or N		

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

T = 3.0

WO# : 10427352
 PM: JMA Due Date: 04/27/18
 CLIENT: PAST-MNFLD

Client Name: Pace MPIS
 Project #: _____
 Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other:
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: 151401163 687A9155100842
 Used: _____ Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: none Date and Initials of Person Examining Contents: ms 4/25/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>Return Samples</u>
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>Wt</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # _____
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Head space in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____
 Field Data Required? Yes No

Project Manager Review: [Signature] Date: 04/26/2018
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

WO#: 12107159



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

MN 12107159

Workorder: 10427352

Workorder Name: 18-00383 MPCA Freeway LF Water

Owner Received Date:

4/13/2018

Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis																																			
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Nitrogen, unionized ammonia, as N</div> <table border="1" style="width: 100%; height: 100%; border-collapse: collapse;"> <tr><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td><td style="width: 33px; height: 20px;"></td></tr> </table> </div>																																			
		Preserved Containers																																								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4																			LAB USE ONLY																	
1	TS-SB-08	PS	4/13/2018 15:20	10427352003	Water	1																																				
2																																										
3																																										
4																																										
5																																										
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																																				
1		<i>Mykes P. Act</i>	4/16/18 1715	<i>CB</i>	4/16/18 1745-																																					
2		<i>CB</i>	4/16/18 2130	<i>B. Mathews</i>	4/17/18 0700																																					
3																																										

Cooler Temperature on Receipt <i>5.6 °C</i>	Custody Seal <input checked="" type="radio"/> Y or N	Received on Ice <input checked="" type="radio"/> Y or N	Samples Intact <input checked="" type="radio"/> Y or N
---	--	---	--

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace - Mpls. Project #: _____

WO# : 12107159
 PM: HRZ Due Date: 04/27/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.3 Cooler Temp Corrected °C: 5.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: 1.3 Date and Initials of Person Examining Contents: 4/17/18 CJB

Comments: Bm 4/17/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Angela Loviel Date: 4/17/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427352 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To: Jennifer Anderson Subcontract To: Pace Analytical Pittsburgh Requested Analysis: WO#: 30249749

Jennifer Anderson
Pace Analytical Minnesota
1700 Elm Street
Suite 200
Minneapolis, MN 55414
Phone (612)607-6451

Pace Analytical Pittsburgh
1638 Roseytown Road
Suites 2,3 & 4
Greensburg, PA 15601
Phone (724)850-5600

WO#: 30249749

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY
						HNO3								
1	TS-SB-08	PS	4/13/2018 15:20	10427352003	Water	3				X	X	X	X	COI
2														
3														
4														
5														

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/16/18	<i>[Signature]</i>	4-17-18 10:25	
2					
3					

Cooler Temperature on Receipt °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace MN

Project # 30249749

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9852 1967

Label <u>QPB</u>
LIMS Login <u>hmm</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot# <u>1021071</u>			Date and Initials of person examining contents: <u>DS 4-17-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>ph<2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>DS</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed: <u>DS</u> Date: <u>4-17-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Pace Analytical®

Client Pace Mon
 Receipt Record Page/Line # 9-2

Work Order #: 4610917

Recorded by (initials/date)

TS 4/17/18

Cooler
 Box
 Other _____

Qty Received
1

IR Gun (#202)
 Thermometer Used Digital Thermometer (#54)
 IR Gun (#402)

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time
<u>Blue</u>	<u>0950</u>						
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact	
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None	
Coolant Location: <u>Dispersed</u> / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom	
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
	Observed °C	Correction Factor °C	Actual °C		Observed °C	Correction Factor °C	Actual °C
Temp Blank:				Temp Blank:			
Sample 1:	<u>1.7</u>	<u>1</u>	<u>1.7</u>	Sample 1:			
Sample 2:	<u>1.0</u>		<u>1.0</u>	Sample 2:			
Sample 3:	<u>1.1</u>		<u>1.1</u>	Sample 3:			
When above 6 °C take a 3 Sample Average °C: _____		When above 6 °C take a 3 Sample Average °C: _____		When above 6 °C take a 3 Sample Average °C: _____		When above 6 °C take a 3 Sample Average °C: _____	
<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?		<input type="checkbox"/> VOC Trip Blank received?	

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

- Yes No
- Chain of Custody record(s)? If No, Initiated By _____
 - Received for Lab Signed/Date/Time?
 - USDA Soil Documents?
 - Sampling / Field Forms?
 - Other _____

COC Information

- Pace COC Other _____
- COC ID Numbers: _____

Check COC for Accuracy

- Yes No
- Analysis Requested?
 - Sample ID matches COC?
 - Sample Date and Time matches COC?
 - All containers indicated are received?

Sample Condition Summary

- N/A Yes No
- Broken containers/lids?
 - Missing or incomplete labels?
 - Illegible information on labels?
 - Low volume received?
 - Inappropriate or non-Pace containers received?
 - VOC vials have headspace?
 - Extra sample locations?
 - Containers not listed on COC?

Check Sample Preservation

- N/A Yes No
- Temperature Blank OR average sample temperature, ≥6° C?
 - If "Yes" was thermal preservation required?
 - If "Yes" were ALL samples collected the same day as receipt?
 - Completed Sample Preservation Verification Form?
 - Samples chemically preserved correctly?
 - If "No", add wire tag and fill out Non-Conformance Form?
 - Received unpreserved Terracore kit?
 - If "Yes" unpreserved vials must be frozen

Work Order Not Logged In with Short Hold / Rush

- Copies of COC To Lab Areas

Notes

- Yes No
- Were all samples logged into Epic?
 - Were all samples labelled?
 - Were samples placed on scan locations?

Initial / Date :

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: <u>Pace minn</u>	Work Order # <u>4610917</u>
Receipt Log # <u>9-2</u>	Project Manager _____
Completed By (initials/date) <u>PS 4/17/18</u>	

COC ID # <u>WO# 10427276</u>												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓												
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

pH Strip Reagent or Lot #
<input checked="" type="checkbox"/> HC727135
<input type="checkbox"/> Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments: _____

COC ID # <u>WO # 10427352</u>												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓												
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments: _____



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194585

Date/Time and Initials of person examining contents: SM 4/17/18 0945

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 1940

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: A 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2.1/2.3 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

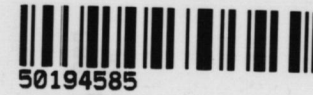
All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		/	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			/
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			/
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		/	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments:

Sample Container Count

WO#: 50194585



CLIENT: Pace MW

COC PAGE 1 of 1

COC ID# _____

Project # 50194585

Bu Kit
50194585
Matrix (Soil/Water/Aqueous) pH <2 pH >9 pH >

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix (Soil/Water/Aqueous)	pH <2	pH >9	pH >
1																		J	A			
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass			Plastic / Misc.				
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
Page 81 of 92	VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac	
	VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic	
	WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic	
	WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic	
	JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass			
			BG3U	250mL Unpreserved Clear Glass			

WO#: 35386559

Chain of Custody



35386559



Samples were sent

State Of Origin: MN

Workorder: 10427276

Workorder Name: 18-00383 MPCA-Freeway LF Water

Owner Received Date: 4/13/2018

Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis																
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668																					
						Preserved Containers										LAB USE ONLY							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	Other	NA2S2O3	Aldicarb/Carbofuran, Method 531.1	Bromate/Chlorite EPA 300.1	Chlorine dioxide SM1500ClO2	Diquat EPA 549.2	Endothall EPA 548.1	Glyphosate EPA 547	Haloacetic acids, total (HAAs) EPA								
1	FD-TT-06	PS	4/12/2018 12:30	10427276001	Water	2	3	2	X	X	X	X	X	X	X								
2																							
3																							
4																							
5																							

Transfers						Comments
Released By	Date/Time	Received By	Date/Time			
<i>[Signature]</i>	4/10/18 11:40	<i>[Signature]</i>	4/17/18 11:00			

Cooler Temperature on Receipt 3.4°C Custody Seal Y or **(N)** Received on Ice **(Y)** or N Samples Intact **(Y)** or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

WO#: 35386559

Project #
Project Manager:
Client:

PM: ADC Due Date: 04/27/18
CLIENT: PACMIN

Date and Initials of person:
Examining contents: PLD
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T-338 Date: 4-17-18 Time: 11:00 Initials: NMP

State of Origin: _____

Cooler #1 Temp.°C 3.4 (Visual) +0 (Correction Factor) 3.4 (Actual)
Cooler #2 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #3 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #4 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #5 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)
Cooler #6 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual)

- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun
- Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832 2036

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 27, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/17/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TS-SB-08 (10427352003)	A181605-01	Water	04/13/2018	04/17/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/17/2018. Sample was received at 4.8 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427352
 Project Manager: Jennifer Anderson

TS-SB-08 (10427352003)

Date Sampled

A181605-01 (Water)

04/13/2018 15:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804168

Acetochlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/19/2018	04/24/2018 15:01	EPA 8270D	

Surrogate: Atrazine-d5		120 %		65.1-122	04/19/2018	04/24/2018 15:01	EPA 8270D	
Surrogate: Parathion-d10		141 %		22.3-159	04/19/2018	04/24/2018 15:01	EPA 8270D	
Surrogate: Triphenyl phosphate		163 %		65.2-151	04/19/2018	04/24/2018 15:01	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804156

2,4-D	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/18/2018	04/24/2018 22:25	EPA 8151A	

Surrogate: 2,4-D-d5		71.4 %		44.2-121	04/18/2018	04/24/2018 22:25	EPA 8151A	
---------------------	--	--------	--	----------	------------	------------------	-----------	--



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 Madison, WI 53718
 608.221.8700 Phone
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Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427352
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch A804168 - EPA 3510C

Blank (A804168-BLK1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 19:13

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.6</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.3</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.529</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>65.2-151</i>			

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Acetochlor	0.954	0.50	ug/L	1.000		95.4	67.5-120			
Alachlor	0.959	0.50	ug/L	1.000		95.9	71.7-120			
Atrazine	0.891	0.50	ug/L	1.000		89.1	72.8-113			
Chlorpyrifos	0.817	0.50	ug/L	1.000		81.7	65.3-119			
Cyanazine	1.01	0.20	ug/L	1.000		101	49.5-140			
Desethylatrazine	0.951	0.50	ug/L	1.000		95.1	66.9-116			
Deisopropylatrazine	0.729	0.50	ug/L	1.000		72.9	44.3-110			
Dimethenamid	0.964	0.50	ug/L	1.000		96.4	63.8-116			
EPTC	0.559	0.50	ug/L	1.000		55.9	41.7-102			
Ethalfuralin	0.538	0.50	ug/L	1.000		53.8	41-127			
Fonofos	0.709	0.50	ug/L	1.000		70.9	59.7-118			
Metolachlor	0.984	0.50	ug/L	1.000		98.4	71.7-122			
Metribuzin	0.911	0.50	ug/L	1.000		91.1	66.6-128			
Pendimethalin	0.946	0.50	ug/L	1.000		94.6	55.5-137			
Phorate	0.577	0.30	ug/L	1.000		57.7	41.2-114			
Prometon	0.958	0.50	ug/L	1.000		95.8	66.3-120			
Propachlor	0.933	0.50	ug/L	1.000		93.3	65.8-119			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Propazine	0.840	0.50	ug/L	1.000		84.0	72-122			
Simazine	0.892	0.50	ug/L	1.000		89.2	72.8-113			
Terbufos	0.514	0.20	ug/L	1.000		51.4	38.6-115			
Triallate	0.622	0.50	ug/L	1.000		62.2	51.4-116			
Trifluralin	0.588	0.50	ug/L	1.000		58.8	46.1-134			
Surrogate: Atrazine-d5	0.451		ug/L	0.5000		90.2	65.1-122			
Surrogate: Parathion-d10	0.495		ug/L	0.5000		99.0	22.3-159			
Surrogate: Triphenyl phosphate	0.534		ug/L	0.5000		107	65.2-151			

Matrix Spike (A804168-MS1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:34

Acetochlor	1.09	0.50	ug/L	0.9346	0.0378	113	67.3-128			
Alachlor	2.58	0.50	ug/L	0.9346	1.50	116	58.2-150			
Atrazine	1.25	0.50	ug/L	0.9346	0.324	98.7	70.1-120			
Chlorpyrifos	1.26	0.50	ug/L	0.9346	0.121	122	73.3-118			M
Cyanazine	1.79	0.20	ug/L	0.9346	0.659	121	60.6-140			
Desethylatrazine	1.05	0.50	ug/L	0.9346	0.0617	106	69.7-122			
Deisopropylatrazine	0.867	0.50	ug/L	0.9346	0.246	66.4	48-121			
Dimethenamid	1.16	0.50	ug/L	0.9346	0.0699	117	63.7-123			
EPTC	0.734	0.50	ug/L	0.9346	0.100	67.8	58-109			
Ethalfluralin	0.652	0.50	ug/L	0.9346	ND	69.7	59.3-129			
Fonofos	0.605	0.50	ug/L	0.9346	0.0263	61.9	73.5-108			M
Metolachlor	65.6	0.50	ug/L	0.9346	67.5	NR	40.9-156			M1, E
Metribuzin	1.03	0.50	ug/L	0.9346	0.0606	104	70.9-136			
Pendimethalin	1.35	0.50	ug/L	0.9346	0.0391	141	55.4-155			
Phorate	0.563	0.30	ug/L	0.9346	0.112	48.2	60.2-108			M
Prometon	1.18	0.50	ug/L	0.9346	0.266	97.8	74.7-124			
Propachlor	0.724	0.50	ug/L	0.9346	ND	77.5	72.3-115			
Propazine	1.31	0.50	ug/L	0.9346	0.472	89.1	73.7-124			
Simazine	0.915	0.50	ug/L	0.9346	ND	97.9	74.8-114			
Terbufos	0.564	0.20	ug/L	0.9346	ND	60.4	56.1-114			
Triallate	0.620	0.50	ug/L	0.9346	ND	66.4	65.5-107			
Trifluralin	0.873	0.50	ug/L	0.9346	0.0370	89.5	58-149			
Surrogate: Atrazine-d5	0.443		ug/L	0.4673		94.7	65.1-122			
Surrogate: Parathion-d10	0.528		ug/L	0.4673		113	22.3-159			
Surrogate: Triphenyl phosphate	0.702		ug/L	0.4673		150	65.2-151			

Matrix Spike Dup (A804168-MSD1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02

Acetochlor	1.10	0.50	ug/L	0.9434	0.0378	112	67.3-128	0.205	20	
Alachlor	2.49	0.50	ug/L	0.9434	1.50	106	58.2-150	3.47	20	
Atrazine	1.20	0.50	ug/L	0.9434	0.324	93.2	70.1-120	3.57	20	
Chlorpyrifos	1.25	0.50	ug/L	0.9434	0.121	119	73.3-118	1.32	20	M
Cyanazine	1.75	0.20	ug/L	0.9434	0.659	116	60.6-140	2.18	20	
Desethylatrazine	1.03	0.50	ug/L	0.9434	0.0617	102	69.7-122	2.35	20	
Deisopropylatrazine	0.790	0.50	ug/L	0.9434	0.246	57.7	48-121	9.23	20	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Matrix Spike Dup (A804168-MSD1)	Source: A181612-06			Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02						
Dimethenamid	1.14	0.50	ug/L	0.9434	0.0699	113	63.7-123	1.98	20	
EPTC	0.759	0.50	ug/L	0.9434	0.100	69.8	58-109	3.38	20	
Ethalfuralin	0.650	0.50	ug/L	0.9434	ND	68.9	59.3-129	0.280	20	
Fonofos	0.581	0.50	ug/L	0.9434	0.0263	58.8	73.5-108	4.15	20	M
Metolachlor	63.8	0.50	ug/L	0.9434	67.5	NR	40.9-156	2.74	20	M1, E
Metribuzin	1.01	0.50	ug/L	0.9434	0.0606	100	70.9-136	2.66	20	
Pendimethalin	1.34	0.50	ug/L	0.9434	0.0391	138	55.4-155	1.06	20	
Phorate	0.583	0.30	ug/L	0.9434	0.112	49.9	60.2-108	3.49	20	M
Prometon	1.15	0.50	ug/L	0.9434	0.266	93.9	74.7-124	2.45	20	
Propachlor	0.706	0.50	ug/L	0.9434	ND	74.8	72.3-115	2.52	20	
Propazine	1.29	0.50	ug/L	0.9434	0.472	86.8	73.7-124	1.08	20	
Simazine	0.862	0.50	ug/L	0.9434	ND	91.4	74.8-114	5.89	20	
Terbufos	0.553	0.20	ug/L	0.9434	ND	58.6	56.1-114	2.07	20	
Triallate	0.606	0.50	ug/L	0.9434	ND	64.2	65.5-107	2.43	20	M
Trifluralin	0.840	0.50	ug/L	0.9434	0.0370	85.1	58-149	3.90	20	
Surrogate: Atrazine-d5	0.431		ug/L	0.4717		91.4	65.1-122			
Surrogate: Parathion-d10	0.485		ug/L	0.4717		103	22.3-159			
Surrogate: Triphenyl phosphate	0.641		ug/L	0.4717		136	65.2-151			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804156 - EPA 3510C

Blank (A804156-BLK1)

Prepared: 04/18/2018 Analyzed: 04/24/2018 19:26

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.01 ug/L 2.016 99.7 44.2-121

LCS (A804156-BS1)

Prepared: 04/18/2018 Analyzed: 04/25/2018 03:47

2,4-D	1.74	0.50	ug/L	2.000		86.9	64.6-148			
2,4-DB	1.99	0.50	ug/L	2.000		99.5	66.7-143			
2,4,5-T	1.78	0.50	ug/L	2.000		88.9	63.4-133			
2,4,5-TP (Silvex)	1.77	0.50	ug/L	2.000		88.4	63-145			
Bentazon	1.06	0.50	ug/L	1.000		106	52.5-139			
Dicamba	1.67	0.50	ug/L	2.000		83.7	55.4-143			
MCPA	1.65	0.30	ug/L	2.000		82.7	33.5-143			
Picloram	0.830	0.50	ug/L	1.000		83.0	47.9-113			
Triclopyr	1.74	0.50	ug/L	2.000		87.0	65.1-141			

Surrogate: 2,4-D-d5

1.94 ug/L 2.016 96.2 44.2-121

LCS Dup (A804156-BSD1)

Prepared: 04/18/2018 Analyzed: 04/25/2018 04:22

2,4-D	1.74	0.50	ug/L	2.000		87.2	64.6-148	0.362	20	
2,4-DB	2.01	0.50	ug/L	2.000		100	66.7-143	0.905	20	
2,4,5-T	1.74	0.50	ug/L	2.000		87.0	63.4-133	2.10	20	
2,4,5-TP (Silvex)	1.85	0.50	ug/L	2.000		92.5	63-145	4.55	20	
Bentazon	0.953	0.50	ug/L	1.000		95.3	52.5-139	10.4	20	
Dicamba	1.79	0.50	ug/L	2.000		89.4	55.4-143	6.62	20	
MCPA	1.79	0.30	ug/L	2.000		89.4	33.5-143	7.77	20	
Picloram	0.822	0.50	ug/L	1.000		82.2	47.9-113	1.02	20	
Triclopyr	1.86	0.50	ug/L	2.000		93.1	65.1-141	6.76	20	

Surrogate: 2,4-D-d5

1.82 ug/L 2.016 90.5 44.2-121

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427352
Project Manager: Jennifer Anderson

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- E The concentration indicated is above the instrument calibration range. This value is an estimated concentration.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A181605



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427352 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/13/2018 Results Requested By: 4/27/2018

Report To		Subcontract To					Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																				
							Preserved Containers															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved															LAB USE ONLY	
1	TS-SB-08	PS	4/13/2018 15:20	10427352003	Water	2																Oi
2																						
3																						
4																						
5																						
																	Comments					
Transfers	Released By	Date/Time	Received By	Date/Time																		
1	<i>[Signature]</i>	4/16/18 16:30	<i>[Signature]</i>	4/17/18																		
2				09:40																		
3																						
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																
4.8 °C		Y or N		Y or N		Y or N																

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274
exp 7/12/18

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

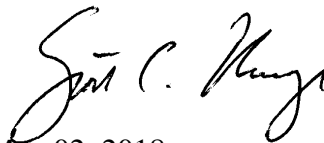
PaceProject#: 10427643
Sample Receipt Date: 04/17/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 02, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 2, 2018



DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. One container was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 65%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

A laboratory spike sample was also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 102%. This result was within the target range for the method. Matrix spikes were prepared with the sample batch using sample material from a separate project; results from these analyses will be provided upon request.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New Hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L


REPORT OF LABORATORY ANALYSIS

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Report No.....10427896

Appendix A

Sample Management

 Minnesota Pollution Control Agency	Chain-of-Custody Form					Work Order Number:		COC Type:		Page: 1 of 1					
	PROJECT/CLIENT INFO					Turnaround Time:		COC ID:		FOR LAB USE ONLY Lab Work Order Sticker					
Facility Code: <i>MPCA - Freeway LE Waters</i>					Program Code (MDH Lab Only):		Lab Name:								
Project Name: <i>MPCA - Freeway LE Waters</i>					Project Task Code:		Address: <i>18-00383</i>								
Project Manager:							<i>EPIC Profile # 38716</i>								
Potential Hazard?					If yes, add information to Sampler Comments Section		Phone No:								
SAMPLE DETAILS								ANALYSIS REQUESTED							
SAMPLE TYPE CODES Sample=Routine Sample S-TVP=Integrated Vertical Profile Sample S-CWOP=Composite Sample		QC=Field Codes QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample		LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe		AR=Air BL=Biological Material OT=Other TS=Tissue		FIELD MATRIX CODES Wt=Ground=Groundwater Wt-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample		ANALYSIS PRESERV.					
Location Identifier	Sample Type	Date	Time	Start Depth, in	End Depth, in	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS			Sampler Comments (filter volume, special handling, etc.)	# of Cont	Lab Sample No.	#
<i>FD-11-10</i>	<i>5</i>	<i>4/17/18</i>	<i>12:12</i>	<i>12</i>	<i>12</i>	<i>G</i>	<i>NW</i>	<i>GROUND</i>					<i>41</i>	<i>001</i>	<i>1</i>
															<i>2</i>
															<i>3</i>
															<i>4</i>
															<i>5</i>
															<i>6</i>
															<i>7</i>
															<i>8</i>
													<i>9</i>		
													<i>10</i>		
Sampled By:					Sampler's Signature:					Phone #:					
Receiving Comments:															
Relinquished By/Affiliation <i>(Sampler) Mike R. Johnson / Pace</i>					Date/Time <i>4/17/18 1730</i>		Accepted By/Affiliation <i>[Signature] / Pace</i>			Date/Time <i>4/17/18 1730</i>					
<i>F=9.2, 6.0</i>															

Sample Condition Upon Receipt

Client Name: Pollution Control

Project #: **WO# 10427643**
 PM: SCII Due Date: 05/02/18
 CLIENT: PAST-MINLED

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: 151401163 Used: 687A9155100842 Type of Ice: Dry Blue None Dry Melted

Cooler Temp Read (°C): 9.0, 8.8 Cooler Temp Corrected (°C): 9.2, 6.0 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ST 4/17/18

USDA Regulated Soil? N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (Internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2. <u>NO LOGS PROVIDED</u>
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>not</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample #
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/18/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold; incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427896

Report No.....10427643_1613TCDD_DFR

Page 7 of 11

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FD-TT-10		
Lab Sample ID	10427643001		
Filename	U180423A_07		
Injected By	BAL		
Total Amount Extracted	496 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/17/2018 12:15
ICAL ID	U180405	Received	04/17/2018 17:30
CCal Filename(s)	U180422B_15	Extracted	04/18/2018 15:45
Method Blank ID	BLANK-61806	Analyzed	04/23/2018 07:08

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	65
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	71

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61806	Matrix	Water
Filename	Y180422A_05	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	04/18/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 16:54
CCal Filename(s)	Y180421B_16	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	66
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	80

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61807	Matrix	Water
Filename	Y180422A_02	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/18/2018 15:45
ICAL ID	Y180204	Analyzed	04/22/2018 14:42
CCal Filename	Y180421B_16	Injected By	BAL
Method Blank ID	BLANK-61806		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	10	7.3	14.6	102
2,3,7,8-TCDD-37Cl4	10	6.8	3.7	15.8	68
2,3,7,8-TCDD-13C	100	60	25.0	141.0	60

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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May 08, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
California Certification #2973
California Certification #2973
Montana Certificate #CERT0103
Alaska Certification UST-107
Alaska Certification UST-107
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #56192 and 56193
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

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CERTIFICATIONS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427644001	FD-TT-10	Water	04/17/18 12:15	04/17/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427644001	FD-TT-10	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NJV	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		
EPA 9016	AMM	1	PASI-GRMI		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	5.9		0.10	1		04/17/18 12:15		
Field Temperature	3.6		0.50	1		04/17/18 12:15		
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/05/18 10:24	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/05/18 10:24	1563-66-2	
Surrogates								
BDMC (S)	104	%	80-120	1		05/05/18 10:24		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		04/27/18 20:44		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/23/18 22:57	04/25/18 11:17	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/23/18 22:57	04/25/18 11:17	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/21/18 00:13	04/26/18 00:03	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	117	%	70-130	1	04/21/18 00:13	04/26/18 00:03	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 01:05	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 01:05	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	103	%	30-150	1	04/24/18 14:16	04/25/18 01:05	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	ug/L	5000	1		04/25/18 15:59	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/23/18 16:27	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	309-00-2	L2
alpha-BHC	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	319-84-6	
beta-BHC	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	319-85-7	
delta-BHC	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	58-89-9	
Chlordane (Technical)	ND	ug/L	10.6	20	04/20/18 13:40	04/25/18 23:16	57-74-9	
alpha-Chlordane	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
gamma-Chlordane	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	5103-74-2	
4,4'-DDD	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	72-54-8	
4,4'-DDE	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	72-55-9	
4,4'-DDT	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	50-29-3	
Dieldrin	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	60-57-1	
Endosulfan I	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	959-98-8	
Endosulfan II	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	33213-65-9	
Endosulfan sulfate	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	1031-07-8	
Endrin	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	72-20-8	
Endrin aldehyde	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	7421-93-4	
Endrin ketone	ND	ug/L	2.1	20	04/20/18 13:40	04/25/18 23:16	53494-70-5	
Heptachlor	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	76-44-8	
Heptachlor epoxide	ND	ug/L	1.1	20	04/20/18 13:40	04/25/18 23:16	1024-57-3	
Methoxychlor	ND	ug/L	10.6	20	04/20/18 13:40	04/25/18 23:16	72-43-5	
Toxaphene	ND	ug/L	31.9	20	04/20/18 13:40	04/25/18 23:16	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	62-125	20	04/20/18 13:40	04/25/18 23:16	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-143	20	04/20/18 13:40	04/25/18 23:16	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 14:55	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	65	%	30-125	1	04/20/18 13:39	04/23/18 14:55	877-09-8	
Decachlorobiphenyl (S)	85	%	30-125	1	04/20/18 13:39	04/23/18 14:55	2051-24-3	CH
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/20/18 11:17	04/21/18 11:27	50-00-0	
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 11:42	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/30/18 15:28	05/01/18 09:12	7429-90-5	
Barium, Dissolved	132	ug/L	10.0	1	04/30/18 15:28	05/01/18 09:12	7440-39-3	
Copper, Dissolved	26.6	ug/L	10.0	1	04/30/18 15:28	05/01/18 09:12	7440-50-8	
Manganese, Dissolved	496	ug/L	5.0	1	04/30/18 15:28	05/01/18 09:12	7439-96-5	
Nickel, Dissolved	159	ug/L	20.0	1	04/30/18 15:28	05/01/18 09:12	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/30/18 15:28	05/01/18 09:12	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	04/30/18 15:28	05/01/18 09:12	7440-31-5	
Zinc, Dissolved	509	ug/L	20.0	1	04/30/18 15:28	05/01/18 09:12	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	22.7	ug/L	2.5	5	04/30/18 16:00	05/01/18 08:11	7440-47-3	
Total Hardness by 2340B	1450000	ug/L	14100	100	04/30/18 16:00	05/01/18 08:45		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	2.1	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-36-0	
Arsenic, Dissolved	1.7	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/30/18 15:28	05/01/18 07:57	7440-41-7	
Boron, Dissolved	7030	ug/L	100	20	04/30/18 15:28	05/01/18 09:20	7440-42-8	
Cadmium, Dissolved	0.93	ug/L	0.080	1	04/30/18 15:28	05/01/18 07:57	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-47-3	
Cobalt, Dissolved	4.1	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-48-4	
Lead, Dissolved	0.67	ug/L	0.10	1	04/30/18 15:28	05/01/18 07:57	7439-92-1	
Selenium, Dissolved	44.0	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7782-49-2	
Thallium, Dissolved	0.57	ug/L	0.10	1	04/30/18 15:28	05/01/18 07:57	7440-28-0	
Uranium-238, Dissolved	16.5	ug/L	0.50	1	04/30/18 15:28	05/01/18 07:57	7440-61-1	
Vanadium, Dissolved	3.7	ug/L	1.0	1	04/30/18 15:28	05/01/18 07:57	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/30/18 14:15	05/01/18 13:53	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/23/18 08:14	04/24/18 21:57		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Phenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	111-44-4	
2-Chlorophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.4	1	04/19/18 14:59	04/23/18 18:36		
N-Nitroso-di-n-propylamine	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	621-64-7	
Hexachloroethane	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	67-72-1	
Nitrobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	98-95-3	
Isophorone	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	78-59-1	
2-Nitrophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	88-75-5	
2,4-Dimethylphenol	ND	ug/L	51.0	1	04/19/18 14:59	04/23/18 18:36	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	120-82-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Naphthalene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	91-20-3	
4-Chloroaniline	ND	ug/L	51.0	1	04/19/18 14:59	04/23/18 18:36	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	91-58-7	
2-Nitroaniline	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	88-74-4	
Dimethylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	131-11-3	
Acenaphthylene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	606-20-2	
3-Nitroaniline	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	99-09-2	
Acenaphthene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	83-32-9	
2,4-Dinitrophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	51-28-5	
4-Nitrophenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	100-02-7	
Dibenzofuran	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	121-14-2	
Diethylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	7005-72-3	
Fluorene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	86-73-7	
4-Nitroaniline	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	534-52-1	
N-Nitrosodiphenylamine	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	101-55-3	
Hexachlorobenzene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	118-74-1	
Pentachlorophenol	ND	ug/L	20.4	1	04/19/18 14:59	04/23/18 18:36	87-86-5	
Phenanthrene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	85-01-8	
Anthracene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	120-12-7	
Di-n-butylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	84-74-2	
Fluoranthene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	206-44-0	
Pyrene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	129-00-0	
Butylbenzylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	51.0	1	04/19/18 14:59	04/23/18 18:36	91-94-1	
Benzo(a)anthracene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	56-55-3	
Chrysene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	117-81-7	
Di-n-octylphthalate	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	117-84-0	
Benzo(b)fluoranthene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	207-08-9	
Benzo(a)pyrene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	122-66-7	
Carbazole	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
1-Methylnaphthalene	ND	ug/L	10.2	1	04/19/18 14:59	04/23/18 18:36	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	73	%.	60-125	1	04/19/18 14:59	04/23/18 18:36	4165-60-0	
2-Fluorobiphenyl (S)	81	%.	56-125	1	04/19/18 14:59	04/23/18 18:36	321-60-8	
p-Terphenyl-d14 (S)	84	%.	58-125	1	04/19/18 14:59	04/23/18 18:36	1718-51-0	
Phenol-d6 (S)	74	%.	58-125	1	04/19/18 14:59	04/23/18 18:36	13127-88-3	
2-Fluorophenol (S)	69	%.	55-125	1	04/19/18 14:59	04/23/18 18:36	367-12-4	
2,4,6-Tribromophenol (S)	98	%.	65-125	1	04/19/18 14:59	04/23/18 18:36	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/19/18 15:38		
Surrogates								
4-Bromofluorobenzene (S)	97	%.	75-125	1		04/19/18 15:38	460-00-4	
Toluene-d8 (S)	97	%.	75-125	1		04/19/18 15:38	2037-26-5	
1,2-Dichloroethane-d4 (S)	98	%.	75-125	1		04/19/18 15:38	17060-07-0	
Field Data								
Analytical Method:								
Field pH	5.9	Std. Units		1		04/17/18 12:15		
Field Temperature	3.6	deg C		1		04/17/18 12:15		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	3.8	mg/L	2.0	1	04/18/18 10:19	04/23/18 10:12		B3
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.9	1		04/27/18 11:31		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	388	NTU	6.0	20		04/18/18 15:34		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	397	mg/L	10.0	1		04/24/18 09:00		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.1	Std. Units	0.10	1		04/27/18 11:10		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	0.023	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	199	mg/L	6.0	5		04/19/18 19:52	16887-00-6	
Fluoride	0.17	mg/L	0.050	1		04/19/18 17:31	16984-48-8	
300.1 Oxihalide IC Anions 14d								
Analytical Method: EPA 300.1								
Chlorite	ND	ug/L	50.0	10		04/22/18 17:22		D3

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ANALYTICAL RESULTS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10	Lab ID: 10427644001	Collected: 04/17/18 12:15	Received: 04/17/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/22/18 17:22	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/18/18 12:38		FS,H1, M1
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:48		
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)							
Nitrogen, Ammonia	0.11	mg/L	0.10	1	04/19/18 15:00	04/20/18 07:17	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	0.025	mg/L	0.020	1		04/18/18 15:24	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		04/18/18 15:24	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.034	mg/L	0.020	1		04/18/18 15:24		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/24/18 16:40	04/24/18 17:42		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	13.4	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:06	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.24	mg/L	0.050	1	04/24/18 09:40	04/24/18 14:03	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 444330	Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1	Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10427644001	

METHOD BLANK: 2409910 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/05/18 01:44	
Carbofuran	ug/L	ND	2.0	05/05/18 01:44	
BDMC (S)	%	107	80-120	05/05/18 01:44	

LABORATORY CONTROL SAMPLE: 2409911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	9.9	99	80-120	
Carbofuran	ug/L	10	11.2	112	80-120	
BDMC (S)	%			105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409912 2409913

Parameter	Units	60268261001 Result	MS		MSD		MS		MSD		% Rec Limits	Max	
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec	RPD	RPD	Qual			
Aldicarb	ug/L	ND	10	10	8.2	8.0	82	80	80-120	2	20	H3	
Carbofuran	ug/L	ND	10	10	9.6	8.6	96	86	80-120	11	20	H3	
BDMC (S)	%						100	106	80-120				

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 443429 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10427644001

METHOD BLANK: 2405632 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/27/18 18:40	

LABORATORY CONTROL SAMPLE: 2405633

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	44.9	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405634 2405635

Parameter	Units	35385680001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	45.6	44.6	91	89	80-120	2	30	H1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405636 2405637

Parameter	Units	35387707062 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	48.9	48.7	98	97	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10427644001

METHOD BLANK: 2027992 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	ug/L	ND	5000	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	ug/L	50000	46800	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Methanol	ug/L	ND	50000	50000	47100	51900	91	101	43-138	10	20

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 438205 Analysis Method: EPA 8015 Alcohol-Glycol
QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
Associated Lab Samples: 10427644001

METHOD BLANK: 2024704 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/23/18 14:09	

LABORATORY CONTROL SAMPLE: 2024705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	29.3	117	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026734 2026735

Parameter	Units	50194690001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethylene glycol	mg/L	ND	25	25	21.9	24.7	87	99	38-154	12	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 21113 Analysis Method: EPA 8316
QC Batch Method: EPA 8316 Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10427644001

METHOD BLANK: 84170 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/24/18 11:22	

LABORATORY CONTROL SAMPLE: 84171

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84172 84173

Parameter	Units	10428032004 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result	% Rec	% Rec					
Acrylamide	ug/L	ND	1000	1000	921	1040	92	104	78-135	12	16		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 535087	Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1	Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 10427644001	

METHOD BLANK: 2907218 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	05/01/18 13:46	

LABORATORY CONTROL SAMPLE & LCSD: 2907219 2907220

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	4.8	97	97	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 535081	Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7	Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10427644001	

METHOD BLANK: 2907200 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	05/01/18 09:04	
Barium, Dissolved	ug/L	ND	10.0	05/01/18 09:04	
Copper, Dissolved	ug/L	ND	10.0	05/01/18 09:04	
Manganese, Dissolved	ug/L	ND	5.0	05/01/18 09:04	
Nickel, Dissolved	ug/L	ND	20.0	05/01/18 09:04	
Silver, Dissolved	ug/L	ND	10.0	05/01/18 09:04	
Tin, Dissolved	ug/L	ND	75.0	05/01/18 09:04	
Zinc, Dissolved	ug/L	ND	20.0	05/01/18 09:04	

LABORATORY CONTROL SAMPLE & LCSD: 2907201

Parameter	Units	2907202								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	21400	21300	107	107	85-115	1	20	
Barium, Dissolved	ug/L	1000	1070	1060	107	106	85-115	0	20	
Copper, Dissolved	ug/L	1000	1030	1020	103	102	85-115	0	20	
Manganese, Dissolved	ug/L	1000	1070	1060	107	106	85-115	1	20	
Nickel, Dissolved	ug/L	1000	1060	1050	106	105	85-115	1	20	
Silver, Dissolved	ug/L	500	515	513	103	103	85-115	1	20	
Tin, Dissolved	ug/L	1000	1030	1020	103	102	85-115	0	20	
Zinc, Dissolved	ug/L	1000	1070	1070	107	107	85-115	0	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 535083	Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8	Analysis Description: 200.8 MET
Associated Lab Samples: 10427644001	

METHOD BLANK: 2907207 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	05/01/18 09:17	

Parameter	Units	2907208		2907209		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
Chromium	ug/L	100	112	108	112	108	85-115	3	20

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 535082 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10427644001

METHOD BLANK: 2907203 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Arsenic, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Beryllium, Dissolved	ug/L	ND	0.20	05/01/18 07:54	
Boron, Dissolved	ug/L	ND	5.0	05/01/18 07:54	
Cadmium, Dissolved	ug/L	ND	0.080	05/01/18 07:54	
Chromium, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Cobalt, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Lead, Dissolved	ug/L	ND	0.10	05/01/18 07:54	
Selenium, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Thallium, Dissolved	ug/L	ND	0.10	05/01/18 07:54	
Uranium-238, Dissolved	ug/L	ND	0.50	05/01/18 07:54	
Vanadium, Dissolved	ug/L	ND	1.0	05/01/18 07:54	

LABORATORY CONTROL SAMPLE & LCSD: 2907204

Parameter	Units	2907205								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Antimony, Dissolved	ug/L	100	94.5	94.6	95	95	85-115	0	20	
Arsenic, Dissolved	ug/L	100	101	105	101	105	85-115	4	20	
Beryllium, Dissolved	ug/L	100	95.9	98.5	96	99	85-115	3	20	
Boron, Dissolved	ug/L	100	98.4	102	98	102	85-115	4	20	
Cadmium, Dissolved	ug/L	100	98.9	104	99	104	85-115	5	20	
Chromium, Dissolved	ug/L	100	101	104	101	104	85-115	3	20	
Cobalt, Dissolved	ug/L	100	99.8	103	100	103	85-115	3	20	
Lead, Dissolved	ug/L	100	101	105	101	105	85-115	4	20	
Selenium, Dissolved	ug/L	100	99.0	101	99	101	85-115	2	20	
Thallium, Dissolved	ug/L	100	97.1	101	97	101	85-115	4	20	
Uranium-238, Dissolved	ug/L	100	102	107	102	107	85-115	5	20	
Vanadium, Dissolved	ug/L	100	100	104	100	104	85-115	3	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533263 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10427644001

METHOD BLANK: 2896754 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/19/18 12:52	
1,2-Dichloroethane-d4 (S)	%	100	75-125	04/19/18 12:52	
4-Bromofluorobenzene (S)	%	96	75-125	04/19/18 12:52	
Toluene-d8 (S)	%	95	75-125	04/19/18 12:52	

LABORATORY CONTROL SAMPLE & LCSD: 2896755

Parameter	Units	2897075							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
Total Trihalomethanes (Calc.)	ug/L	80	79.9	77.2	100	96	70-130	3	20		
1,2-Dichloroethane-d4 (S)	%				100	100	75-125				
4-Bromofluorobenzene (S)	%				96	97	75-125				
Toluene-d8 (S)	%				96	97	75-125				

MATRIX SPIKE SAMPLE: 2897077

Parameter	Units	10427761007						Qualifiers
		Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits		
Total Trihalomethanes (Calc.)	ug/L	ND	80	80.7	101	70-130		
1,2-Dichloroethane-d4 (S)	%				100	75-125		
4-Bromofluorobenzene (S)	%				97	75-125		
Toluene-d8 (S)	%				96	75-125		

SAMPLE DUPLICATE: 2897076

Parameter	Units	60268271001				Qualifiers
		Result	Dup Result	RPD	Max RPD	
Total Trihalomethanes (Calc.)	ug/L	ND	ND		20	
1,2-Dichloroethane-d4 (S)	%	102	102	0		
4-Bromofluorobenzene (S)	%	98	95	3		
Toluene-d8 (S)	%	95	96	0		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 441896 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10427644001

METHOD BLANK: 2398250 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/24/18 16:59	

LABORATORY CONTROL SAMPLE: 2398251

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	52.4	105	64-137	

LABORATORY CONTROL SAMPLE: 2398252

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	8J	89	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2399191 2399192

Parameter	Units	35387317001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	<4.3	50	50	39.4	38.6	79	77	64-137	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2399777 2399778

Parameter	Units	35387490001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	34.5	21.0	69	42	64-137	49	30	M1,R1

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 442185 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10427644001

METHOD BLANK: 2399617 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/25/18 09:23	
Paraquat	ug/L	ND	0.40	04/25/18 09:23	

LABORATORY CONTROL SAMPLE: 2399618

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.9	94	70-130	
Paraquat	ug/L	2	1.7	87	70-130	

LABORATORY CONTROL SAMPLE: 2399619

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.60	150	50-150	
Paraquat	ug/L	.4	0.42	105	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400097 2400098

Parameter	Units	35387317001 Result	MS Spike Conc.	MSD Spike Conc.	2400097		2400098		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.0	1.9	100	93	70-130	7	30	
Paraquat	ug/L	<0.30	2	2	1.5	1.5	76	75	70-130	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400099 2400100

Parameter	Units	35387317002 Result	MS Spike Conc.	MSD Spike Conc.	2400099		2400100		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	1.9	1.7	95	87	70-130	9	30	
Paraquat	ug/L	<0.30	2	2	1.5	1.4	77	69	70-130	11	30 M1	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 441812 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10427644001

METHOD BLANK: 2397907 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Dichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/25/18 15:02	
Monobromoacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Monochloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
Trichloroacetic Acid	ug/L	ND	1.0	04/25/18 15:02	
2,3-Dibromopropanoic Acid (S)	%	115	70-130	04/25/18 15:02	

LABORATORY CONTROL SAMPLE: 2397908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	12.4	124	70-130	
Dichloroacetic Acid	ug/L	10	10.5	105	70-130	
Haloacetic Acids (Total)	ug/L	50	55.7	111	70-130	
Monobromoacetic Acid	ug/L	10	10.8	108	70-130	
Monochloroacetic Acid	ug/L	10	10.9	109	70-130	
Trichloroacetic Acid	ug/L	10	11.1	111	70-130	
2,3-Dibromopropanoic Acid (S)	%			123	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398523 2398524

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.75J	10	10	13.2	12.5	125	117	70-130	6	30	
Dichloroacetic Acid	ug/L	28.5	10	10	40.3	37.2	119	87	70-130	8	30	
Haloacetic Acids (Total)	ug/L	33.1	50	50	93.8	88.0	121	110	70-130	6	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	11.0	11.5	110	115	70-130	5	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	13.7	12.1	137	121	70-130	12	30	M1
Trichloroacetic Acid	ug/L	3.9	10	10	15.6	14.7	117	109	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						136	114	70-130		30	S0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2398525 2398526

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35386593002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	0.76J	10	10	12.5	12.9	117	122	70-130	4	30	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Parameter	Units	2398525		2398526		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		35386593002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dichloroacetic Acid	ug/L	28.5	10	10	36.8	36.9	83	84	70-130	0	30	
Haloacetic Acids (Total)	ug/L	33.2	50	50	85.7	87.0	105	108	70-130	2	30	
Monobromoacetic Acid	ug/L	0.29U	10	10	10.9	10.5	109	105	70-130	4	30	
Monochloroacetic Acid	ug/L	0.90U	10	10	11.5	12.0	115	120	70-130	4	30	
Trichloroacetic Acid	ug/L	3.9	10	10	14.0	14.7	101	108	70-130	5	30	
2,3-Dibromopropanoic Acid (S)	%						110	116	70-130		30	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 534073

Analysis Method: EPA 8011

QC Batch Method: EPA 8011

Analysis Description: GCS 8011 EDB DBCP

Associated Lab Samples: 10427644001

METHOD BLANK: 2901365

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

2901367

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%				107	106	30-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533542 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10427644001

METHOD BLANK: 2898180 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDE	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDT	ug/L	ND	0.10	04/25/18 19:54	
Aldrin	ug/L	ND	0.050	04/25/18 19:54	
alpha-BHC	ug/L	ND	0.050	04/25/18 19:54	
alpha-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
beta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Chlordane (Technical)	ug/L	ND	0.50	04/25/18 19:54	
delta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Dieldrin	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan I	ug/L	ND	0.050	04/25/18 19:54	
Endosulfan II	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan sulfate	ug/L	ND	0.10	04/25/18 19:54	
Endrin	ug/L	ND	0.10	04/25/18 19:54	
Endrin aldehyde	ug/L	ND	0.10	04/25/18 19:54	
Endrin ketone	ug/L	ND	0.10	04/25/18 19:54	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/25/18 19:54	
gamma-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor epoxide	ug/L	ND	0.050	04/25/18 19:54	
Methoxychlor	ug/L	ND	0.50	04/25/18 19:54	
Toxaphene	ug/L	ND	1.5	04/25/18 19:54	
Decachlorobiphenyl (S)	%	75	30-143	04/25/18 19:54	
Tetrachloro-m-xylene (S)	%	80	62-125	04/25/18 19:54	

LABORATORY CONTROL SAMPLE & LCSD: 2898181

Parameter	Units	2898182							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	0.95	104	95	67-125	10	20		
4,4'-DDE	ug/L	1	1.0	0.90	100	90	68-125	11	20		
4,4'-DDT	ug/L	1	0.92	0.83	92	83	66-125	10	20		
Aldrin	ug/L	.5	0.21	0.17	42	34	46-125	21	20	L2,R1	
alpha-BHC	ug/L	.5	0.50	0.45	101	90	66-125	11	20		
alpha-Chlordane	ug/L	.5	0.49	0.43	97	86	72-125	12	20		
beta-BHC	ug/L	.5	0.49	0.45	99	89	72-125	10	20		
delta-BHC	ug/L	.5	0.42	0.37	83	75	37-141	11	20		
Dieldrin	ug/L	1	1.1	1.0	112	100	71-125	11	20		
Endosulfan I	ug/L	.5	0.48	0.43	96	86	69-125	10	20		
Endosulfan II	ug/L	1	1.1	0.98	108	98	73-125	10	20		
Endosulfan sulfate	ug/L	1	0.96	0.87	96	87	63-127	9	20		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Parameter	Units	2898181		2898182			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	0.92	103	92	72-125	11	20	
Endrin aldehyde	ug/L	1	1.0	0.92	101	92	70-125	10	20	
Endrin ketone	ug/L	1	1.1	0.98	108	98	72-127	10	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.45	101	91	69-125	11	20	
gamma-Chlordane	ug/L	.5	0.43	0.38	86	75	64-125	14	20	
Heptachlor	ug/L	.5	0.34	0.28	67	57	54-125	17	20	
Heptachlor epoxide	ug/L	.5	0.50	0.45	101	90	72-125	11	20	
Methoxychlor	ug/L	5	4.6	4.2	92	84	67-127	9	20	
Decachlorobiphenyl (S)	%				80	76	30-143			
Tetrachloro-m-xylene (S)	%				85	70	62-125			

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533544 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427644001

METHOD BLANK: 2898185 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/23/18 14:24	
Decachlorobiphenyl (S)	%	105	30-125	04/23/18 14:24	CH
Tetrachloro-m-xylene (S)	%	50	30-125	04/23/18 14:24	

Parameter	Units	2898186		2898187		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
PCB-1016 (Aroclor 1016)	ug/L	2	1.1	1.5	55	73	47-125	28	20 R1
PCB-1260 (Aroclor 1260)	ug/L	2	1.2	1.7	62	84	54-125	30	20 R1
Decachlorobiphenyl (S)	%				78	103	30-125		CH
Tetrachloro-m-xylene (S)	%				46	60	30-125		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 533322

Analysis Method: EPA 8270D

QC Batch Method: EPA 3520

Analysis Description: 8270D Water MSSV

Associated Lab Samples: 10427644001

METHOD BLANK: 2897016

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,2-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,2-Diphenylhydrazine	ug/L	ND	10.0	04/23/18 13:12	
1,3-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,4-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2,4,5-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dimethylphenol	ug/L	ND	50.0	04/23/18 13:12	
2,4-Dinitrophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dinitrotoluene	ug/L	ND	10.0	04/23/18 13:12	
2,6-Dinitrotoluene	ug/L	ND	10.0	04/23/18 13:12	
2-Chloronaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Chlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/23/18 13:12	
2-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
2-Nitrophenol	ug/L	ND	10.0	04/23/18 13:12	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/23/18 13:12	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/23/18 13:12	
3-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
4,6-Dinitro-2-methylphenol	ug/L	ND	10.0	04/23/18 13:12	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
4-Chloro-3-methylphenol	ug/L	ND	10.0	04/23/18 13:12	
4-Chloroaniline	ug/L	ND	50.0	04/23/18 13:12	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
4-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
4-Nitrophenol	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthene	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthylene	ug/L	ND	10.0	04/23/18 13:12	
Anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(b)fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(g,h,i)perylene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(k)fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroisopropyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/23/18 13:12	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

METHOD BLANK: 2897016 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Carbazole	ug/L	ND	10.0	04/23/18 13:12	
Chrysene	ug/L	ND	10.0	04/23/18 13:12	
Di-n-butylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Di-n-octylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dibenz(a,h)anthracene	ug/L	ND	10.0	04/23/18 13:12	
Dibenzofuran	ug/L	ND	10.0	04/23/18 13:12	
Diethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dimethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Fluorene	ug/L	ND	10.0	04/23/18 13:12	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	04/23/18 13:12	
Hexachlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
Hexachloroethane	ug/L	ND	10.0	04/23/18 13:12	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Isophorone	ug/L	ND	10.0	04/23/18 13:12	
N-Nitroso-di-n-propylamine	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/23/18 13:12	
Naphthalene	ug/L	ND	10.0	04/23/18 13:12	
Nitrobenzene	ug/L	ND	10.0	04/23/18 13:12	
Pentachlorophenol	ug/L	ND	20.0	04/23/18 13:12	
Phenanthrene	ug/L	ND	10.0	04/23/18 13:12	
Phenol	ug/L	ND	10.0	04/23/18 13:12	
Pyrene	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Tribromophenol (S)	%	100	65-125	04/23/18 13:12	
2-Fluorobiphenyl (S)	%	85	56-125	04/23/18 13:12	
2-Fluorophenol (S)	%	90	55-125	04/23/18 13:12	
Nitrobenzene-d5 (S)	%	87	60-125	04/23/18 13:12	
p-Terphenyl-d14 (S)	%	105	58-125	04/23/18 13:12	
Phenol-d6 (S)	%	91	58-125	04/23/18 13:12	

LABORATORY CONTROL SAMPLE & LCSD: 2897017

Parameter	Units	Spike Conc.	2897018		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
			LCS Result	LCSD Result						
1,2,4-Trichlorobenzene	ug/L	50	43.4	41.0	87	82	54-125	6	20	
1,2-Dichlorobenzene	ug/L	50	42.4	40.5	85	81	35-125	4	20	
1,2-Diphenylhydrazine	ug/L	50	46.0	44.0	92	88	68-125	4	20	
1,3-Dichlorobenzene	ug/L	50	41.3	40.1	83	80	30-125	3	20	
1,4-Dichlorobenzene	ug/L	50	41.1	40.4	82	81	33-125	2	20	
1-Methylnaphthalene	ug/L	50	45.7	43.8	91	88	67-125	4	20	
2,4,5-Trichlorophenol	ug/L	50	47.5	45.2	95	90	74-125	5	20	
2,4,6-Trichlorophenol	ug/L	50	47.6	46.1	95	92	74-125	3	20	
2,4-Dichlorophenol	ug/L	50	46.2	45.8	92	92	68-125	1	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

LABORATORY CONTROL SAMPLE & LCSD: 2897017

2897018

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4-Dimethylphenol	ug/L	50	36.7J	33.2J	73	66	33-125		20	
2,4-Dinitrophenol	ug/L	50	44.2	49.6	88	99	30-127	12	20	
2,4-Dinitrotoluene	ug/L	50	56.5	54.7	113	109	75-125	3	20	
2,6-Dinitrotoluene	ug/L	50	52.6	51.2	105	102	75-125	3	20	
2-Chloronaphthalene	ug/L	50	46.9	45.4	94	91	70-125	3	20	
2-Chlorophenol	ug/L	50	42.5	40.8	85	82	61-125	4	20	
2-Methylnaphthalene	ug/L	50	45.8	43.0	92	86	67-125	6	20	
2-Methylphenol(o-Cresol)	ug/L	50	43.3	40.4	87	81	63-125	7	20	
2-Nitroaniline	ug/L	50	47.4	45.8	95	92	73-125	3	20	
2-Nitrophenol	ug/L	50	48.1	46.0	96	92	64-125	4	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.9	42.1	88	84	67-125	4	20	
3,3'-Dichlorobenzidine	ug/L	50	55.6	52.5	111	105	60-125	6	20	
3-Nitroaniline	ug/L	50	55.7	53.3	111	107	73-125	4	20	
4,6-Dinitro-2-methylphenol	ug/L	50	55.3	56.3	111	113	42-127	2	20	2M
4-Bromophenylphenyl ether	ug/L	50	48.0	46.6	96	93	75-125	3	20	
4-Chloro-3-methylphenol	ug/L	50	49.9	47.0	100	94	75-125	6	20	
4-Chloroaniline	ug/L	50	43.9J	41J	88	82	60-125		20	
4-Chlorophenylphenyl ether	ug/L	50	48.7	47.0	97	94	74-125	4	20	
4-Nitroaniline	ug/L	50	48.4	47.5	97	95	69-125	2	20	
4-Nitrophenol	ug/L	50	46.6	45.7	93	91	62-125	2	20	
Acenaphthene	ug/L	50	47.1	45.3	94	91	74-125	4	20	
Acenaphthylene	ug/L	50	47.1	45.2	94	90	72-125	4	20	
Anthracene	ug/L	50	48.4	46.0	97	92	75-125	5	20	
Benzo(a)anthracene	ug/L	50	49.4	48.5	99	97	75-125	2	20	
Benzo(a)pyrene	ug/L	50	48.6	47.8	97	96	75-125	2	20	
Benzo(b)fluoranthene	ug/L	50	49.8	48.3	100	97	75-125	3	20	
Benzo(g,h,i)perylene	ug/L	50	51.0	49.5	102	99	73-125	3	20	
Benzo(k)fluoranthene	ug/L	50	49.3	48.2	99	96	75-125	2	20	
bis(2-Chloroethoxy)methane	ug/L	50	44.6	42.9	89	86	67-125	4	20	
bis(2-Chloroethyl) ether	ug/L	50	39.9	37.8	80	76	55-125	5	20	
bis(2-Chloroisopropyl) ether	ug/L	50	34.7	33.2	69	66	52-125	5	20	2M
bis(2-Ethylhexyl)phthalate	ug/L	50	55.2	54.2	110	108	72-129	2	20	
Butylbenzylphthalate	ug/L	50	54.4	51.4	109	103	69-127	6	20	
Carbazole	ug/L	50	50.4	48.2	101	96	75-125	4	20	
Chrysene	ug/L	50	49.9	48.6	100	97	75-125	3	20	
Di-n-butylphthalate	ug/L	50	53.2	50.5	106	101	75-125	5	20	
Di-n-octylphthalate	ug/L	50	56.1	54.8	112	110	69-131	2	20	
Dibenz(a,h)anthracene	ug/L	50	52.1	51.1	104	102	74-125	2	20	
Dibenzofuran	ug/L	50	48.8	46.3	98	93	75-125	5	20	
Diethylphthalate	ug/L	50	50.4	49.0	101	98	75-125	3	20	
Dimethylphthalate	ug/L	50	50.6	49.1	101	98	75-125	3	20	
Fluoranthene	ug/L	50	50.0	48.2	100	96	75-125	4	20	
Fluorene	ug/L	50	47.8	46.5	96	93	75-125	3	20	
Hexachloro-1,3-butadiene	ug/L	50	42.8	41.1	86	82	37-125	4	20	
Hexachlorobenzene	ug/L	50	49.3	47.2	99	94	74-125	4	20	
Hexachloroethane	ug/L	50	42.8	40.0	86	80	30-125	7	20	
Indeno(1,2,3-cd)pyrene	ug/L	50	51.3	50.3	103	101	74-125	2	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Parameter	Units	2897017		2897018			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Isophorone	ug/L	50	45.7	42.8	91	86	72-125	7	20	
N-Nitroso-di-n-propylamine	ug/L	50	43.0	42.3	86	85	65-125	2	20	
N-Nitrosodimethylamine	ug/L	50	42.8	39.7	86	79	52-125	7	20	
N-Nitrosodiphenylamine	ug/L	50	49.5	47.5	99	95	75-125	4	20	
Naphthalene	ug/L	50	43.8	41.5	88	83	58-125	5	20	
Nitrobenzene	ug/L	50	43.1	40.2	86	80	64-125	7	20	
Pentachlorophenol	ug/L	50	42.8	40.6	86	81	52-125	5	20	
Phenanthrene	ug/L	50	47.3	45.6	95	91	75-125	4	20	
Phenol	ug/L	50	41.4	40.1	83	80	59-125	3	20	
Pyrene	ug/L	50	50.4	49.0	101	98	75-125	3	20	
2,4,6-Tribromophenol (S)	%				95	91	65-125			
2-Fluorobiphenyl (S)	%				80	74	56-125			
2-Fluorophenol (S)	%				76	72	55-125			
Nitrobenzene-d5 (S)	%				77	72	60-125			
p-Terphenyl-d14 (S)	%				95	92	58-125			
Phenol-d6 (S)	%				76	73	58-125			

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 20900	Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A	Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10427644001	

METHOD BLANK: 83416 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/21/18 11:17	

LABORATORY CONTROL SAMPLE: 83417

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	358	90	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 83418 83419

Parameter	Units	10427644001		MS		MSD		% Rec		Max		Qual	
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD
Formaldehyde	ug/L	ND	400	400	400	360	369	87	90	35-167	3	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 532917

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10427644001

METHOD BLANK: 2894166

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/23/18 09:53	B3

LABORATORY CONTROL SAMPLE: 2894168

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	228	115	85-115	B3

SAMPLE DUPLICATE: 2894169

Parameter	Units	10427534001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	ND	ND		20	B2,B3

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 534707	Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG	Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10427644001	

METHOD BLANK: 2905010 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/27/18 09:22	

LABORATORY CONTROL SAMPLE: 2905011

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	38.3	96	78-114	

MATRIX SPIKE SAMPLE: 2905012

Parameter	Units	10428294001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	40	34.7	83	78-114	

SAMPLE DUPLICATE: 2905013

Parameter	Units	40167780001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	1.7J	2.2J		18	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533083 Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1 Analysis Description: 180.1 Turbidity
Associated Lab Samples: 10427644001

METHOD BLANK: 2895150 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/18/18 15:33	

LABORATORY CONTROL SAMPLE: 2895151

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.2	98	90-110	

SAMPLE DUPLICATE: 2895152

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	388	386	1	20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 533730

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 10427644001

METHOD BLANK: 2899115

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/24/18 09:00	

LABORATORY CONTROL SAMPLE: 2899116

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	96.0	96	80-120	

SAMPLE DUPLICATE: 2899117

Parameter	Units	10427621001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	145	138	5	10	

SAMPLE DUPLICATE: 2899118

Parameter	Units	10427624001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	381	382	0	10	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 534745 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10427644001

LABORATORY CONTROL SAMPLE: 2905104

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2905105

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.0	1	3	H6

SAMPLE DUPLICATE: 2905106

Parameter	Units	10427668001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	3	H6

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533253 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10427644001

METHOD BLANK: 2896722 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/19/18 11:32	
Fluoride	mg/L	ND	0.050	04/19/18 11:32	

LABORATORY CONTROL SAMPLE: 2896723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Fluoride	mg/L	1	0.92	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896724 2896725

Parameter	Units	10427232002		2896724		2896725		% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	0.32J	12.5	12.5	12.0	12.0	94	93	90-110	0	20		
Fluoride	mg/L	<0.0028	1	1	1.0	0.94	103	94	90-110	9	20		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 442023 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427644001

METHOD BLANK: 2399126 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399127

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	39.8	99	85-115	

MATRIX SPIKE SAMPLE: 2399129

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	400	377	94	75-125	

SAMPLE DUPLICATE: 2399128

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 442024	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427644001	

METHOD BLANK: 2399130 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/22/18 13:44	

LABORATORY CONTROL SAMPLE: 2399131

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	8.1	101	85-115	

MATRIX SPIKE SAMPLE: 2399133

Parameter	Units	10427644001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	77.2	97	75-125	

SAMPLE DUPLICATE: 2399132

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 532952	Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10427644001	

METHOD BLANK: 2894297 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/18/18 12:38	FS

LABORATORY CONTROL SAMPLE: 2894298

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	105	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2894299 2894300

Parameter	Units	10427644001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	.2	.2	0.16	0.15	75	73	85-115	3	20	FS,H1, M1

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 140957

Analysis Method: EPA 350.1 rev. 2 (1993)

QC Batch Method: EPA 350.1 rev. 2 (1993)

Analysis Description: 350.1 Ammonia Distilled

Associated Lab Samples: 10427644001

METHOD BLANK: 557837

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/20/18 07:08	

LABORATORY CONTROL SAMPLE: 557838

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 557839

557840

Parameter	Units	12107304003 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec			
Nitrogen, Ammonia	mg/L	ND	5	5	4.8	5.0	94	99	90-110	5	10		

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 533073	Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2	Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10427644001	

METHOD BLANK: 2894868 Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/18/18 15:28	FS
Nitrite as N	mg/L	ND	0.020	04/18/18 15:28	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/18/18 15:28	FS

LABORATORY CONTROL SAMPLE: 2894869

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	100	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2894870 2894871

Parameter	Units	10427644001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrite as N	mg/L	ND	1	1	1.0	1.0	100	102	90-110	2	20	FS
Nitrogen, NO2 plus NO3	mg/L	0.034	1	1	1.0	1.0	102	102	90-110	0	20	FS

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 21104 Analysis Method: EPA 9016
 QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
 Associated Lab Samples: 10427644001

METHOD BLANK: 84163 Matrix: Water
 Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/24/18 17:31	

LABORATORY CONTROL SAMPLE: 84164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	148	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84165 84166

Parameter	Units	10427352003		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Cyanide, Free	ug/L	ND	150	150	142	143	95	95	80-120	1	11	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 534468 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10427644001

METHOD BLANK: 2903673 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/27/18 09:57	

LABORATORY CONTROL SAMPLE: 2903674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	258	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903675 2903676

Parameter	Units	10428172001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	10.1	250	250	238	242	91	93	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903677 2903678

Parameter	Units	10428174001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	10.6	250	250	241	242	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

QC Batch: 533937 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10427644001

METHOD BLANK: 2900160 Matrix: Water
Associated Lab Samples: 10427644001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/24/18 13:46	

LABORATORY CONTROL SAMPLE: 2900161

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	0.95	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2900162 2900163

Parameter	Units	10427703001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	3.9	1	1	5.0	5.0	105	104	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2900164 2900165

Parameter	Units	10427897001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	7.7	1	1	8.4	8.5	76	83	80-120	1	30	M1

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Sample: FD-TT-10 **Lab ID: 10427644001** Collected: 04/17/18 12:15 Received: 04/17/18 17:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	29.2 ± 8.77 (8.78) C:NA T:NA	pCi/L	04/24/18 18:57	12587-46-1	
Gross Beta	EPA 900.0	4.35 ± 4.73 (8.16) C:NA T:NA	pCi/L	04/24/18 18:57	12587-47-2	
Radium-226	EPA 903.1	1.54 ± 0.735 (0.772) C:NA T:95%	pCi/L	04/30/18 11:23	13982-63-3	
Radium-228	EPA 904.0	0.856 ± 0.544 (1.04) C:77% T:68%	pCi/L	04/30/18 14:35	15262-20-1	
Total Radium	Total Radium Calculation	2.40 ± 1.28 (1.81)	pCi/L	05/02/18 13:00	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 295467

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10427644001

METHOD BLANK: 1446536

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.666 ± 0.451 (1.40) C:NA T:NA	pCi/L	04/24/18 19:40	
Gross Beta	0.326 ± 0.562 (1.25) C:NA T:NA	pCi/L	04/24/18 19:40	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

QC Batch: 295478

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10427644001

METHOD BLANK: 1446554

Matrix: Water

Associated Lab Samples: 10427644001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.335 (0.752) C:NA T:89%	pCi/L	04/30/18 11:23	

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QUALIFIERS

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-I Pace Analytical Services - Indianapolis
PASI-M Pace Analytical Services - Minneapolis
PASI-O Pace Analytical Services - Ormond Beach
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427644
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 533263
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

BATCH QUALIFIERS

Batch: 533719

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533817

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534052

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534707

[BE] Batch extracted by solid phase extraction (SPE).

Batch: 535186

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 535198

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 535220

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

- 1M Sample was dark brown in color.
- 2M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- B2 Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
- B3 The dissolved oxygen depletion of the dilution water blank exceeded 0.2 mg/L.
- CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- FS The sample was filtered in the laboratory prior to analysis.
- H1 Analysis conducted outside the EPA method holding time.
- H1 Analysis conducted outside the recognized method holding time.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- H6 Analysis initiated outside of the 15 minute EPA required holding time.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- R1 RPD value was outside control limits.
- S0 Surrogate recovery outside laboratory control limits.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-0383 MPC-Freeway LF Waters
Pace Project No.: 10427644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427644001	FD-TT-10				
10427644001	FD-TT-10	EPA 531.1	444330		
10427644001	FD-TT-10	EPA 547	443429		
10427644001	FD-TT-10	EPA 549.2	442185	EPA 549.2	442515
10427644001	FD-TT-10	EPA 552.3	441812	EPA 552.3	442081
10427644001	FD-TT-10	EPA 8011	534073	EPA 8011	534336
10427644001	FD-TT-10	EPA 8015 Alcohol-Glycol	438905		
10427644001	FD-TT-10	EPA 8015 Alcohol-Glycol	438205		
10427644001	FD-TT-10	EPA Mod. 3510C	533542	EPA 8081B	534052
10427644001	FD-TT-10	EPA Mod. 3510C	533544	EPA 8082A	533719
10427644001	FD-TT-10	EPA 8315A	20900	EPA 8315A	20933
10427644001	FD-TT-10	EPA 8316	21113		
10427644001	FD-TT-10	EPA 200.7	535081	EPA 200.7	535241
10427644001	FD-TT-10	EPA 200.8	535083	EPA 200.8	535198
10427644001	FD-TT-10	EPA 200.8	535082	EPA 200.8	535220
10427644001	FD-TT-10	EPA 245.1	535087	EPA 245.1	535186
10427644001	FD-TT-10	EPA 548.1	441896	EPA 548.1	442399
10427644001	FD-TT-10	EPA 3520	533322	EPA 8270D	533817
10427644001	FD-TT-10	EPA 524.2	533263		
10427644001	FD-TT-10				
10427644001	FD-TT-10	EPA 900.0	295467		
10427644001	FD-TT-10	EPA 903.1	295478		
10427644001	FD-TT-10	EPA 904.0	295491		
10427644001	FD-TT-10	Total Radium Calculation	296799		
10427644001	FD-TT-10	Hach 10360	532917	Hach 10360 Rev 1.1	533230
10427644001	FD-TT-10	EPA 1664A OG	534707		
10427644001	FD-TT-10	EPA 180.1	533083		
10427644001	FD-TT-10	SM 2540D	533730		
10427644001	FD-TT-10	SM 4500-H+B	534745		
10427644001	FD-TT-10	Trivalent Chromium Calculation	535426		
10427644001	FD-TT-10	EPA 300.0	533253		
10427644001	FD-TT-10	EPA 300.1	442023		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-0383 MPC-Freeway LF Waters

Pace Project No.: 10427644

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427644001	FD-TT-10	EPA 300.1	442024		
10427644001	FD-TT-10	SM 3500-Cr B Modified	532952		
10427644001	FD-TT-10	EPA 350.1			
10427644001	FD-TT-10	EPA 350.1 rev. 2 (1993)	140957	EPA 350.1 rev. 2 (1993)	141065
10427644001	FD-TT-10	EPA 353.2	533073		
10427644001	FD-TT-10	EPA 9016	21104	EPA 9016	21181
10427644001	FD-TT-10	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10427644001	FD-TT-10	SM 4500-P B	533937	SM 4500-P E	533991

REPORT OF LABORATORY ANALYSIS

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WO# 10427644



Chain-of-Custody Form

Work Order Number: 10427644

Turnaround Time: COCID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO		LABORATORY	
Facility Code: MPCA - Freeway LF Waters	Program Code (MDH Lab Only):	Lab Name:	
Project Name: MPCA - Freeway LF Waters	Project Task Code:	Address: 18-00383	
Project Manager:		EPIC Profile # 38716	
Potential Hazard?	If yes, add information to Sampler Comments Section	Phone No:	

Lab Work Order Sticker

SAMPLE DETAILS										ANALYSIS REQUESTED																		
SAMPLE TYPE CODES		QC-FB=Field Blank Sample		QC-FR=Field Replicate Sample		QC-TB=Trip Blank Sample		LAB MATRIX CODES		AR=Air		BL=Biological Material		OT=Other		TS=Tissue		FIELD MATRIX CODES		Wt=Ground=Groundwater		Ws=Surf=Surface Water		QC-BLANK=Artificial Blank Water		Leachate=Leachate Sample		
Location Identifier	Sample Type	Date	Time	Start Depth, in	End Depth, in	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.														Lab Sample No.	#
FD-11-10 12-12-9	S	4/17/18	12:15	12'	12'	G	NW	WTF-Ground			41	X	X														001	1
None 4/17/18																												

Sampled By: Sampler's Signature: Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) Matt R. Pace	4/17/18 1730	Matt R. Pace	4/17/18 1730

=9.2, 6.0

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Sample Condition Upon Receipt **Client Name:** POLLUTION CONTROL **Project #:** _____

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____

Tracking Number: _____

WO# : 10427644

PM: JMA **Due Date: 05/02/18**

CLIENT: PACE-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted
Used: 687A9155100842

Cooler Temp Read (°C): 9.0, 5.8 **Cooler Temp Corrected (°C):** 9.2, 6.0 **Biological Tissue Frozen?** Yes No N/A
Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** BT 4/17/18

USDA Regulated Soil N/A, water sample)
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	*2. NO LISTS PROVIDED
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No - Pace Containers Used? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No - Includes Date/Time/ID/Analysis Matrix: <u>not</u>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Sample # <u>1</u> <u>5/5</u> <u>1/1</u> <u>1/1</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: BA **Date:** 4/18/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).



Document Name: Sample Condition Upon Receipt Form	Document Revised: 15Mar2016 Page 1 of 1
Document No.: F-VM-C-001-Rev.10	Issuing Authority: Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace - Mpls.

Project #:

NO# : 12107322
 M: HRZ Due Date: 05/02/18
 CLIENT: PACE Mpls

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 4.3 Cooler Temp Corrected °C: 4.6 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 4/18/18 HRZ

Comments: Bm 4/18/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review:

Angela Loisel

Date: 4/19/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace MN

Project # 30250027

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2389

Label	<u>BXH</u>
LIMS Login	<u>BXH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
 Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>BXH 4-19-18</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH<2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>BXH</u> Date/time of preservation: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Rad Aqueous Samples Screened > 0.5 mrem/hr	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Initial when completed: <u>BXH</u> Date: <u>4-19-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

WO# : 35387261



35387261

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427644 Workorder Name: 18-0383 MPC-Freeway LF Waters Owner Received Date: 4/17/2018 Results Requested By: 5/2/2018

Report To		Subcontract To				Requested Analysis										LAB USE ONLY							
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Ormond Beach 8 East Tower Circle Ormond Beach, FL 32174 Phone (386)672-5668				Other	Unpreserved	NA2S2O3															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix																		
1	FD-TT-10	PS	4/17/2018 12:15	10427644001	Water	2	2	2					X	X	X	X	X	X	X				
2																							
3																							
4																							
5																							

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	4/15/18 1620	<i>[Signature]</i>	4/19/18 1130						
	T339								

Cooler Temperature on Receipt 2.0 °C Custody Seal (Y) or (N) FBI Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

WO# : 35387261 (SCUR)

Project #
Project Manager:
Client:

PM: ADC
CLIENT: PACMIN
Due Date: 04/30/18

Date and Initials of person:
Examining contents: _____
Label: _____
Deliver: _____
pH: _____

Thermometer Used: T339 Date: 4/19/18 Time: 1130 Initials: _____

State of Origin: _____

- Cooler #1 Temp.°C 17 (Visual) 10.3 (Correction Factor) 20 (Actual) Samples on ice, cooling process has begun
- Cooler #2 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
- Cooler #3 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
- Cooler #4 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
- Cooler #5 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
- Cooler #6 Temp.°C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832 2390

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

Comments:

Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: _____

Date: _____

SAMPLE RECEIVING / LOG-IN CHECKLIST



Client <u>Pace Minnesota</u>	Work Order # <u>4611026</u>
Receipt Record Page/Line # <u>13-1</u>	

Recorded by (initials/date) <u>RS 4/19/18</u>	<input type="checkbox"/> Cooler	Qty Received <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202)	<input type="checkbox"/> Thermometer Used
	<input type="checkbox"/> Box		<input type="checkbox"/> Digital Thermometer (#54)	
	<input type="checkbox"/> Other		<input type="checkbox"/> IR Gun (#402)	

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time	
<u>White</u>	<u>0831</u>							
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C	Temp Blank	Observed °C	Correction Factor °C	Actual °C	Temp Blank	
Sample 1: <u>1.1</u>	<u>1</u>	<u>1.1</u>		Sample 1:				
Sample 2: <u>1.7</u>	<u>1</u>	<u>1.7</u>		Sample 2:				
Sample 3: <u>1.0</u>	<u>1</u>	<u>1.0</u>		Sample 3:				
When above 6 °C take a 3 Sample Average °C: _____			When above 6 °C take a 3 Sample Average °C: _____			When above 6 °C take a 3 Sample Average °C: _____		
<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

Yes No

Chain of Custody record(s)? If No, Initiated By _____

Received for Lab Signed/Date/Time?

USDA Soil Documents?

Sampling / Field Forms?

Other _____

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes No

Analysis Requested?

Sample ID matches COC?

Sample Date and Time matches COC?

All containers indicated are received?

Sample Condition Summary

N/A	Yes	No
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Broken containers/lids?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Missing or incomplete labels?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Illegible information on labels?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Low volume received?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Inappropriate or non-Pace containers received?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> VOC vials have headspace?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Extra sample locations?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Containers not listed on COC?

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6 °C?

If "Yes" was thermal preservation required?

If "Yes" were ALL samples collected the same day as receipt?

Completed Sample Preservation Verification Form?

Samples chemically preserved correctly?

If "No", add wire tag and fill out Non-Conformance Form?

Received unpreserved Terracore kit?

If "Yes" unpreserved vials must be frozen

Work Order Not Logged In with Short Hold / Rush

Copies of COC To Lab Areas

Notes

No subside vial.

Yes No

Were all samples logged into Epic?

Were all samples labelled?

Were samples placed on scan locations?

Initial / Date : RS 4/19/18

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client <i>Pace Minnesota</i>	Work Order # <i>4611026</i>
Receipt Log # <i>131</i>	Completed By (initials/date) <i>[Signature] 4/19/18</i>
Project Manager	

COC ID #												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1	✓	N/A											
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

**pH Strip
Reagent or Lot #**

HC727135

Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (all adjustments must be reviewed by the project manager). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach an orange preservation tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments:

COC ID #												Adjusted by: _____	
												Date: _____	
Container Type	5 / 23		4		13		6		15				
Preservative	NaOH >12		H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2				
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	
COC Line #1													
COC Line #2													
COC Line #3													
COC Line #4													
COC Line #5													
COC Line #6													
COC Line #7													
COC Line #8													
COC Line #9													
COC Line #10													
COC Line #11													
COC Line #12													

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments:

SAMPLE CONDITION UPON RECEIPT FORM



Project #: 5019d851

Date/Time and Initials of person examining contents: TJR 4/19/20 1440

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 8970 2424

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | **Samples collected today and on ice:** Yes No N/A

Cooler Temperature: 5.9/5.6 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		-	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		/		All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.		
Chain of Custody Present:	/		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			/
Chain of Custody Filled Out:	/		Dissolved Metals field filtered?:			/
Short Hold Time Analysis (<72hr)?: Analysis:		/	Headspace Wisconsin Sulfide			/
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			/
Rush TAT Requested:		/	Headspace in VOA Vials (>6mm):			/
Containers Intact?:	/		Trip Blank Present?:		-	
Sample Labels Match COC?: Except TCs, which only require sample ID	/		Trip Blank Custody Seals?:		/	

Comments:

Sample Container Count

WO#: 50194851



50194851

CLIENT: Page MN

COC PAGE 1 of 1

COC ID# _____

Project # 50194851

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit	Matrix Sl/ (Soil/Wat Aqueous	pH <2	pH >9	pH >12	
																	R					
1																	R	DG9H 2				
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WG9U	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

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2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 28, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/19/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427644
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FD-TT-10 (10427644001)	A181617-01	Water	04/17/2018	04/19/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/19/2018. Sample was received at 4.8 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

The LC footnote on sample A181617-01 states that there was a low CCV recovery for prometon. The lower control limit is 80% and the lowest recovery was 71.7%.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427644
 Project Manager: Jennifer Anderson

FD-TT-10 (10427644001)

Date Sampled

A181617-01 (Water)

04/17/2018 12:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804168

Acetochlor	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/19/2018	04/25/2018 14:21	EPA 8270D	

Surrogate: Atrazine-d5		90.7 %		65.1-122	04/19/2018	04/25/2018 14:21	EPA 8270D	
Surrogate: Parathion-d10		117 %		22.3-159	04/19/2018	04/25/2018 14:21	EPA 8270D	
Surrogate: Triphenyl phosphate		147 %		65.2-151	04/19/2018	04/25/2018 14:21	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804192

2,4-D	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:01	EPA 8151A	

Surrogate: 2,4-D-d5		95.0 %		44.2-121	04/24/2018	04/24/2018 23:01	EPA 8151A	
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608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427644
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Blank (A804168-BLK1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 19:13

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.6</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.3</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.529</i>		<i>ug/L</i>	<i>0.5000</i>		<i>106</i>	<i>65.2-151</i>			

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Acetochlor	0.954	0.50	ug/L	1.000		95.4	67.5-120			
Alachlor	0.959	0.50	ug/L	1.000		95.9	71.7-120			
Atrazine	0.891	0.50	ug/L	1.000		89.1	72.8-113			
Chlorpyrifos	0.817	0.50	ug/L	1.000		81.7	65.3-119			
Cyanazine	1.01	0.20	ug/L	1.000		101	49.5-140			
Desethylatrazine	0.951	0.50	ug/L	1.000		95.1	66.9-116			
Deisopropylatrazine	0.729	0.50	ug/L	1.000		72.9	44.3-110			
Dimethenamid	0.964	0.50	ug/L	1.000		96.4	63.8-116			
EPTC	0.559	0.50	ug/L	1.000		55.9	41.7-102			
Ethalfuralin	0.538	0.50	ug/L	1.000		53.8	41-127			
Fonofos	0.709	0.50	ug/L	1.000		70.9	59.7-118			
Metolachlor	0.984	0.50	ug/L	1.000		98.4	71.7-122			
Metribuzin	0.911	0.50	ug/L	1.000		91.1	66.6-128			
Pendimethalin	0.946	0.50	ug/L	1.000		94.6	55.5-137			
Phorate	0.577	0.30	ug/L	1.000		57.7	41.2-114			
Prometon	0.958	0.50	ug/L	1.000		95.8	66.3-120			
Propachlor	0.933	0.50	ug/L	1.000		93.3	65.8-119			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427644
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

LCS (A804168-BS1)

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:05

Propazine	0.840	0.50	ug/L	1.000		84.0	72-122			
Simazine	0.892	0.50	ug/L	1.000		89.2	72.8-113			
Terbufos	0.514	0.20	ug/L	1.000		51.4	38.6-115			
Triallate	0.622	0.50	ug/L	1.000		62.2	51.4-116			
Trifluralin	0.588	0.50	ug/L	1.000		58.8	46.1-134			
Surrogate: Atrazine-d5	0.451		ug/L	0.5000		90.2	65.1-122			
Surrogate: Parathion-d10	0.495		ug/L	0.5000		99.0	22.3-159			
Surrogate: Triphenyl phosphate	0.534		ug/L	0.5000		107	65.2-151			

Matrix Spike (A804168-MS1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 21:34

Acetochlor	1.09	0.50	ug/L	0.9346	0.0378	113	67.3-128			
Alachlor	2.58	0.50	ug/L	0.9346	1.50	116	58.2-150			
Atrazine	1.25	0.50	ug/L	0.9346	0.324	98.7	70.1-120			
Chlorpyrifos	1.26	0.50	ug/L	0.9346	0.121	122	73.3-118			M
Cyanazine	1.79	0.20	ug/L	0.9346	0.659	121	60.6-140			
Desethylatrazine	1.05	0.50	ug/L	0.9346	0.0617	106	69.7-122			
Deisopropylatrazine	0.867	0.50	ug/L	0.9346	0.246	66.4	48-121			
Dimethenamid	1.16	0.50	ug/L	0.9346	0.0699	117	63.7-123			
EPTC	0.734	0.50	ug/L	0.9346	0.100	67.8	58-109			
Ethalfuralin	0.652	0.50	ug/L	0.9346	ND	69.7	59.3-129			
Fonofos	0.605	0.50	ug/L	0.9346	0.0263	61.9	73.5-108			M
Metolachlor	65.6	0.50	ug/L	0.9346	67.5	NR	40.9-156			M1, E
Metribuzin	1.03	0.50	ug/L	0.9346	0.0606	104	70.9-136			
Pendimethalin	1.35	0.50	ug/L	0.9346	0.0391	141	55.4-155			
Phorate	0.563	0.30	ug/L	0.9346	0.112	48.2	60.2-108			M
Prometon	1.18	0.50	ug/L	0.9346	0.266	97.8	74.7-124			
Propachlor	0.724	0.50	ug/L	0.9346	ND	77.5	72.3-115			
Propazine	1.31	0.50	ug/L	0.9346	0.472	89.1	73.7-124			
Simazine	0.915	0.50	ug/L	0.9346	ND	97.9	74.8-114			
Terbufos	0.564	0.20	ug/L	0.9346	ND	60.4	56.1-114			
Triallate	0.620	0.50	ug/L	0.9346	ND	66.4	65.5-107			
Trifluralin	0.873	0.50	ug/L	0.9346	0.0370	89.5	58-149			
Surrogate: Atrazine-d5	0.443		ug/L	0.4673		94.7	65.1-122			
Surrogate: Parathion-d10	0.528		ug/L	0.4673		113	22.3-159			
Surrogate: Triphenyl phosphate	0.702		ug/L	0.4673		150	65.2-151			

Matrix Spike Dup (A804168-MSD1)

Source: A181612-06

Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02

Acetochlor	1.10	0.50	ug/L	0.9434	0.0378	112	67.3-128	0.205	20	
Alachlor	2.49	0.50	ug/L	0.9434	1.50	106	58.2-150	3.47	20	
Atrazine	1.20	0.50	ug/L	0.9434	0.324	93.2	70.1-120	3.57	20	
Chlorpyrifos	1.25	0.50	ug/L	0.9434	0.121	119	73.3-118	1.32	20	M
Cyanazine	1.75	0.20	ug/L	0.9434	0.659	116	60.6-140	2.18	20	
Desethylatrazine	1.03	0.50	ug/L	0.9434	0.0617	102	69.7-122	2.35	20	
Deisopropylatrazine	0.790	0.50	ug/L	0.9434	0.246	57.7	48-121	9.23	20	



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 608.221.4889 Fax

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 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427644
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804168 - EPA 3510C

Matrix Spike Dup (A804168-MSD1)	Source: A181612-06			Prepared: 04/19/2018 Analyzed: 04/24/2018 22:02						
Dimethenamid	1.14	0.50	ug/L	0.9434	0.0699	113	63.7-123	1.98	20	
EPTC	0.759	0.50	ug/L	0.9434	0.100	69.8	58-109	3.38	20	
Ethalfuralin	0.650	0.50	ug/L	0.9434	ND	68.9	59.3-129	0.280	20	
Fonofos	0.581	0.50	ug/L	0.9434	0.0263	58.8	73.5-108	4.15	20	M
Metolachlor	63.8	0.50	ug/L	0.9434	67.5	NR	40.9-156	2.74	20	M1, E
Metribuzin	1.01	0.50	ug/L	0.9434	0.0606	100	70.9-136	2.66	20	
Pendimethalin	1.34	0.50	ug/L	0.9434	0.0391	138	55.4-155	1.06	20	
Phorate	0.583	0.30	ug/L	0.9434	0.112	49.9	60.2-108	3.49	20	M
Prometon	1.15	0.50	ug/L	0.9434	0.266	93.9	74.7-124	2.45	20	
Propachlor	0.706	0.50	ug/L	0.9434	ND	74.8	72.3-115	2.52	20	
Propazine	1.29	0.50	ug/L	0.9434	0.472	86.8	73.7-124	1.08	20	
Simazine	0.862	0.50	ug/L	0.9434	ND	91.4	74.8-114	5.89	20	
Terbufos	0.553	0.20	ug/L	0.9434	ND	58.6	56.1-114	2.07	20	
Triallate	0.606	0.50	ug/L	0.9434	ND	64.2	65.5-107	2.43	20	M
Trifluralin	0.840	0.50	ug/L	0.9434	0.0370	85.1	58-149	3.90	20	
Surrogate: Atrazine-d5	0.431		ug/L	0.4717		91.4	65.1-122			
Surrogate: Parathion-d10	0.485		ug/L	0.4717		103	22.3-159			
Surrogate: Triphenyl phosphate	0.641		ug/L	0.4717		136	65.2-151			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427644
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804192 - EPA 3510C

Blank (A804192-BLK1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 07:56

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.11 ug/L 2.016 105 44.2-121

LCS (A804192-BS1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 04:58

2,4-D	1.70	0.50	ug/L	2.000		84.9	64.6-148			
2,4-DB	1.79	0.50	ug/L	2.000		89.7	66.7-143			
2,4,5-T	1.58	0.50	ug/L	2.000		79.1	63.4-133			
2,4,5-TP (Silvex)	1.69	0.50	ug/L	2.000		84.7	63-145			
Bentazon	0.901	0.50	ug/L	1.000		90.1	52.5-139			
Dicamba	1.54	0.50	ug/L	2.000		77.2	55.4-143			
MCPA	1.59	0.30	ug/L	2.000		79.7	33.5-143			
Picloram	0.849	0.50	ug/L	1.000		84.9	47.9-113			
Triclopyr	1.79	0.50	ug/L	2.000		89.7	65.1-141			

Surrogate: 2,4-D-d5

1.66 ug/L 2.016 82.4 44.2-121

LCS Dup (A804192-BSD1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 11:48

2,4-D	1.76	0.50	ug/L	2.000		87.9	64.6-148	3.43	20	
2,4-DB	1.76	0.50	ug/L	2.000		88.1	66.7-143	1.81	20	
2,4,5-T	1.49	0.50	ug/L	2.000		74.4	63.4-133	6.16	20	
2,4,5-TP (Silvex)	1.73	0.50	ug/L	2.000		86.6	63-145	2.29	20	
Bentazon	0.811	0.50	ug/L	1.000		81.1	52.5-139	10.5	20	
Dicamba	1.63	0.50	ug/L	2.000		81.6	55.4-143	5.55	20	
MCPA	1.58	0.30	ug/L	2.000		79.2	33.5-143	0.648	20	
Picloram	0.712	0.50	ug/L	1.000		71.2	47.9-113	17.5	20	
Triclopyr	1.51	0.50	ug/L	2.000		75.4	65.1-141	17.3	20	

Surrogate: 2,4-D-d5

1.77 ug/L 2.016 87.7 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 18-00383 MPCA Freeway LF Water - MN Project Number: 10427644 Project Manager: Jennifer Anderson
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Notes and Definitions

- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- E The concentration indicated is above the instrument calibration range. This value is an estimated concentration.
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

May 12, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 18, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
California Certification #2973
Alaska Certification UST-107
Montana Certificate #CERT0103
California Certification #2973
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007
Nevada DNR #MN010842018-1
Oklahoma Department of Environmental Quality
California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #57971 and 57972
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10427826001	FL-TT-02	Water	04/18/18 15:15	04/18/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10427826001	FL-TT-02	EPA 531.1	AC1	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	TT3	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-ClO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMB	1	PASI-O
SM 3500-Cr B Modified	JFP	1	PASI-M		
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	5.9		0.10	1		04/18/18 15:15		
Field Temperature	3.6		0.50	1		04/18/18 15:15		
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/05/18 19:51	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/05/18 19:51	1563-66-2	
Surrogates								
BDMC (S)	104	%	80-120	1		05/05/18 19:51		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		04/28/18 03:45		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 13:12	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 13:12	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	631-64-1	M1
Dichloroacetic Acid	ND	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	79-43-6	
Haloacetic Acids (Total)	5.0	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	79-08-3	
Monochloroacetic Acid	5.0	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	79-11-8	M1
Trichloroacetic Acid	ND	ug/L	1.0	1	04/24/18 00:54	04/26/18 09:06	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	128	%	70-130	1	04/24/18 00:54	04/26/18 09:06	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 01:31	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 01:31	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	112	%	30-150	1	04/24/18 14:16	04/25/18 01:31	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/25/18 16:08	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/23/18 16:36	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	309-00-2	L2
alpha-BHC	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	319-84-6	
beta-BHC	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	319-85-7	
delta-BHC	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	58-89-9	
Chlordane (Technical)	ND	ug/L	5.1	10	04/20/18 13:40	04/25/18 23:34	57-74-9	
alpha-Chlordane	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
gamma-Chlordane	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	5103-74-2	
4,4'-DDD	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	72-54-8	
4,4'-DDE	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	72-55-9	
4,4'-DDT	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	50-29-3	
Dieldrin	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	60-57-1	
Endosulfan I	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	959-98-8	
Endosulfan II	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	33213-65-9	
Endosulfan sulfate	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	1031-07-8	
Endrin	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	72-20-8	
Endrin aldehyde	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	7421-93-4	
Endrin ketone	ND	ug/L	1.0	10	04/20/18 13:40	04/25/18 23:34	53494-70-5	
Heptachlor	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	76-44-8	
Heptachlor epoxide	ND	ug/L	0.51	10	04/20/18 13:40	04/25/18 23:34	1024-57-3	
Methoxychlor	ND	ug/L	5.1	10	04/20/18 13:40	04/25/18 23:34	72-43-5	
Toxaphene	ND	ug/L	15.4	10	04/20/18 13:40	04/25/18 23:34	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	0	%	62-125	10	04/20/18 13:40	04/25/18 23:34	877-09-8	1M, D3, S4
Decachlorobiphenyl (S)	0	%	30-143	10	04/20/18 13:40	04/25/18 23:34	2051-24-3	S4
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11141-16-5	
PCB-1242 (Aroclor 1242)	27.7	ug/L	1.0	10	04/20/18 13:39	04/24/18 08:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	12672-29-6	
PCB-1254 (Aroclor 1254)	3.8	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:11	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	52	%	30-125	1	04/20/18 13:39	04/23/18 15:11	877-09-8	
Decachlorobiphenyl (S)	55	%	30-125	1	04/20/18 13:39	04/23/18 15:11	2051-24-3	CH
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/20/18 11:17	04/21/18 11:47	50-00-0	
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 11:51	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/23/18 14:49	04/25/18 17:57	7429-90-5	
Barium, Dissolved	494	ug/L	10.0	1	04/23/18 14:49	04/25/18 17:57	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 17:57	7440-50-8	
Manganese, Dissolved	985	ug/L	5.0	1	04/23/18 14:49	04/25/18 17:57	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 17:57	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 17:57	7440-22-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 17:57	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 17:57	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	58.0	ug/L	2.5	5	04/20/18 10:29	04/20/18 17:01	7440-47-3	
Total Hardness by 2340B	674000	ug/L	35200	250	04/20/18 10:29	04/20/18 17:04		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	0.58	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-36-0	
Arsenic, Dissolved	7.3	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/25/18 09:01	7440-41-7	
Boron, Dissolved	536	ug/L	100	20	04/23/18 14:28	04/24/18 19:42	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/25/18 09:01	7440-43-9	
Chromium, Dissolved	1.3	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-47-3	
Cobalt, Dissolved	3.2	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-48-4	
Lead, Dissolved	0.71	ug/L	0.10	1	04/23/18 14:28	04/25/18 09:01	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/25/18 09:01	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/25/18 09:01	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/23/18 14:28	04/25/18 09:01	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:07	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/24/18 08:48	04/25/18 09:18		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Phenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	111-44-4	
2-Chlorophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.6	1	04/19/18 14:59	04/23/18 19:06		
N-Nitroso-di-n-propylamine	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	621-64-7	
Hexachloroethane	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	67-72-1	
Nitrobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	98-95-3	
Isophorone	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	78-59-1	
2-Nitrophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	88-75-5	
2,4-Dimethylphenol	ND	ug/L	51.5	1	04/19/18 14:59	04/23/18 19:06	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	120-82-1	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02		Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Naphthalene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	91-20-3	
4-Chloroaniline	ND	ug/L	51.5	1	04/19/18 14:59	04/23/18 19:06	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	91-58-7	
2-Nitroaniline	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	88-74-4	
Dimethylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	131-11-3	
Acenaphthylene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	606-20-2	
3-Nitroaniline	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	99-09-2	
Acenaphthene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	83-32-9	
2,4-Dinitrophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	51-28-5	
4-Nitrophenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	100-02-7	
Dibenzofuran	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	121-14-2	
Diethylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	7005-72-3	
Fluorene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	86-73-7	
4-Nitroaniline	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	534-52-1	
N-Nitrosodiphenylamine	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	101-55-3	
Hexachlorobenzene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	118-74-1	
Pentachlorophenol	ND	ug/L	20.6	1	04/19/18 14:59	04/23/18 19:06	87-86-5	
Phenanthrene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	85-01-8	
Anthracene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	120-12-7	
Di-n-butylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	84-74-2	
Fluoranthene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	206-44-0	
Pyrene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	129-00-0	
Butylbenzylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	51.5	1	04/19/18 14:59	04/23/18 19:06	91-94-1	
Benzo(a)anthracene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	56-55-3	
Chrysene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	218-01-9	
bis(2-Ethylhexyl)phthalate	13.8	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	117-81-7	
Di-n-octylphthalate	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	117-84-0	
Benzo(b)fluoranthene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	207-08-9	
Benzo(a)pyrene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	122-66-7	
Carbazole	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
1-Methylnaphthalene	ND	ug/L	10.3	1	04/19/18 14:59	04/23/18 19:06	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	71	%.	60-125	1	04/19/18 14:59	04/23/18 19:06	4165-60-0	
2-Fluorobiphenyl (S)	75	%.	56-125	1	04/19/18 14:59	04/23/18 19:06	321-60-8	
p-Terphenyl-d14 (S)	69	%.	58-125	1	04/19/18 14:59	04/23/18 19:06	1718-51-0	
Phenol-d6 (S)	74	%.	58-125	1	04/19/18 14:59	04/23/18 19:06	13127-88-3	
2-Fluorophenol (S)	70	%.	55-125	1	04/19/18 14:59	04/23/18 19:06	367-12-4	
2,4,6-Tribromophenol (S)	91	%.	65-125	1	04/19/18 14:59	04/23/18 19:06	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/19/18 16:02		
Surrogates								
4-Bromofluorobenzene (S)	98	%.	75-125	1		04/19/18 16:02	460-00-4	
Toluene-d8 (S)	94	%.	75-125	1		04/19/18 16:02	2037-26-5	
1,2-Dichloroethane-d4 (S)	101	%.	75-125	1		04/19/18 16:02	17060-07-0	
Field Data								
Analytical Method:								
Field pH	5.9	Std. Units		1		04/18/18 15:15		
Field Temperature	3.6	deg C		1		04/18/18 15:15		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	21.6	mg/L	20.0	10	04/19/18 13:35	04/24/18 10:06		
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.9	1		04/30/18 10:26		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	620	NTU	15.0	50		04/19/18 10:57		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	518	mg/L	20.0	1		04/24/18 16:10		
4500CIO2 Chlorine Dioxide								
Analytical Method: SM 4500-CIO2								
Chlorine Dioxide	ND	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.3	Std. Units	0.10	1		04/27/18 11:20		H6
Trivalent Chromium Calculation								
Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	0.058	mg/L	0.010	1		04/24/18 15:01		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	15.2	mg/L	1.2	1		04/19/18 18:19	16887-00-6	
Fluoride	0.053	mg/L	0.050	1		04/19/18 18:19	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02	Lab ID: 10427826001	Collected: 04/18/18 15:15	Received: 04/18/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	500	100		04/25/18 06:34		D3,M6
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/24/18 14:44	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/19/18 10:10		FS,M1
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:49		
350.1 Ammonia, Undistilled	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	10.6	mg/L	0.50	5		04/24/18 11:20	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	ND	mg/L	0.020	1		04/20/18 14:05	14797-55-8	FS
Nitrite as N	0.039	mg/L	0.020	1		04/20/18 14:05	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.038	mg/L	0.020	1		04/20/18 14:05		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/24/18 16:40	04/24/18 17:43		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	22.0	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:15	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	0.29	mg/L	0.050	1	04/26/18 09:33	04/27/18 12:16	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch:	444330	Analysis Method:	EPA 531.1
QC Batch Method:	EPA 531.1	Analysis Description:	531.1 HPLC Carbamate
Associated Lab Samples:	10427826001		

METHOD BLANK: 2409910 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/05/18 01:44	
Carbofuran	ug/L	ND	2.0	05/05/18 01:44	
BDMC (S)	%	107	80-120	05/05/18 01:44	

LABORATORY CONTROL SAMPLE: 2409911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	9.9	99	80-120	
Carbofuran	ug/L	10	11.2	112	80-120	
BDMC (S)	%			105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2409912 2409913

Parameter	Units	60268261001		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Aldicarb	ug/L	ND	10	10	10	8.2	8.0	82	80	80-120	2	20	H3	
Carbofuran	ug/L	ND	10	10	10	9.6	8.6	96	86	80-120	11	20	H3	
BDMC (S)	%							100	106	80-120				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 443433 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10427826001

METHOD BLANK: 2405647 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	04/28/18 01:40	

LABORATORY CONTROL SAMPLE: 2405648

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	49.4	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405649 2405650

Parameter	Units	35388467001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	47.5	47.7	95	95	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405651 2405652

Parameter	Units	35387317003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	<4.2	50	50	52.0	53.2	104	106	80-120	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol
 QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified
 Associated Lab Samples: 10427826001

METHOD BLANK: 2027992 Matrix: Water
 Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	46.8	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Methanol	mg/L	ND	50	50	47.1	51.9	91	101	43-138	10	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 438205 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10427826001

METHOD BLANK: 2024704 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/23/18 14:09	

LABORATORY CONTROL SAMPLE: 2024705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	29.3	117	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026734 2026735

Parameter	Units	50194690001 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec			
Ethylene glycol	mg/L	ND	25	25	21.9	24.7	87	99	38-154	12	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch:	21113	Analysis Method:	EPA 8316
QC Batch Method:	EPA 8316	Analysis Description:	8316 W GCSV Acrylamide
Associated Lab Samples:	10427826001		

METHOD BLANK: 84170 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/24/18 11:22	

LABORATORY CONTROL SAMPLE: 84171

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84172 84173

Parameter	Units	10428032004		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Acrylamide	ug/L	ND	1000	1000	1000	921	1040	92	104	78-135	12	16		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533449

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury - Dissolved

Associated Lab Samples: 10427826001

METHOD BLANK: 2897827

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/23/18 17:53	

LABORATORY CONTROL SAMPLE & LCSD: 2897828

2897829

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	4.8	98	96	85-115	3	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533435 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10427826001

METHOD BLANK: 2897770 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/25/18 17:32	
Barium, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Copper, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Manganese, Dissolved	ug/L	ND	5.0	04/25/18 17:32	
Nickel, Dissolved	ug/L	ND	20.0	04/25/18 17:32	
Silver, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Tin, Dissolved	ug/L	ND	75.0	04/25/18 17:32	
Zinc, Dissolved	ug/L	ND	20.0	04/25/18 17:32	

LABORATORY CONTROL SAMPLE: 2897771

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	103	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	986	99	85-115	
Manganese, Dissolved	ug/L	1000	1050	105	85-115	
Nickel, Dissolved	ug/L	1000	1060	106	85-115	
Silver, Dissolved	ug/L	500	503	101	85-115	
Tin, Dissolved	ug/L	1000	1040	104	85-115	
Zinc, Dissolved	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897772 2897773

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427742001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21200	21400	106	107	70-130	1	30
Barium, Dissolved	ug/L	95.0	1000	1000	1130	1140	104	104	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	70-130	1	30
Manganese, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	70-130	1	30
Silver, Dissolved	ug/L	ND	500	500	509	514	102	103	70-130	1	30
Tin, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Zinc, Dissolved	ug/L	36.2	1000	1000	1070	1070	103	104	70-130	1	30

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

MATRIX SPIKE SAMPLE: 2898920		10428032004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	358	20000	22100	109	70-130	
Barium, Dissolved	ug/L	607	1000	1630	102	70-130	
Copper, Dissolved	ug/L	ND	1000	1020	102	70-130	
Manganese, Dissolved	ug/L	902	1000	1940	103	70-130	
Nickel, Dissolved	ug/L	ND	1000	1030	102	70-130	
Silver, Dissolved	ug/L	ND	500	515	103	70-130	
Tin, Dissolved	ug/L	ND	1000	1040	104	70-130	
Zinc, Dissolved	ug/L	ND	1000	1030	102	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533161 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10427826001

METHOD BLANK: 2896376 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/20/18 15:51	

LABORATORY CONTROL SAMPLE: 2896377

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	111	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896378 2896379

Parameter	Units	30249372002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	ug/L	9.4	100	100	118	121	108	112	70-130	3	20	

MATRIX SPIKE SAMPLE: 2897736

Parameter	Units	30249394002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	17.6	100	129	111	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533428 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10427826001

METHOD BLANK: 2897737 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Arsenic, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Beryllium, Dissolved	ug/L	ND	0.20	04/25/18 08:49	
Boron, Dissolved	ug/L	ND	5.0	04/25/18 08:49	
Cadmium, Dissolved	ug/L	ND	0.080	04/25/18 08:49	
Chromium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Cobalt, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Lead, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Selenium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Thallium, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Uranium-238, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Vanadium, Dissolved	ug/L	ND	1.0	04/25/18 08:49	

LABORATORY CONTROL SAMPLE: 2897738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.4	99	85-115	
Arsenic, Dissolved	ug/L	100	99.4	99	85-115	
Beryllium, Dissolved	ug/L	100	107	107	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	99.0	99	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	102	102	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	101	101	85-115	
Vanadium, Dissolved	ug/L	100	99.6	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739 2897740

Parameter	Units	10427867001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Spike Conc.						
Antimony, Dissolved	ug/L	0.0029 mg/L	100	110	108	107	105	70-130	2	20		
Arsenic, Dissolved	ug/L	ND	100	112	109	111	109	70-130	2	20		
Beryllium, Dissolved	ug/L	ND	100	107	104	107	104	70-130	3	20		
Boron, Dissolved	ug/L	32.5	100	137	133	104	101	70-130	2	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739												2897740	
Parameter	Units	10427867001		MS	MSD	MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Cadmium, Dissolved	ug/L	ND	100	100	100	101	102	101	101	70-130	2	20	
Chromium, Dissolved	ug/L	ND	100	100	109	107	109	107	107	70-130	2	20	
Cobalt, Dissolved	ug/L	3.7	100	100	108	106	104	103	103	70-130	1	20	
Lead, Dissolved	ug/L	ND	100	100	105	103	105	103	103	70-130	3	20	
Selenium, Dissolved	ug/L	0.00058	100	100	114	111	113	110	110	70-130	2	20	
		mg/L											
Thallium, Dissolved	ug/L	ND	100	100	104	100	104	100	100	70-130	4	20	
Uranium-238, Dissolved	ug/L	10.3	100	100	118	116	108	106	106	70-130	2	20	
Vanadium, Dissolved	ug/L	ND	100	100	110	108	110	108	108	70-130	2	20	

MATRIX SPIKE SAMPLE: 2897741											
Parameter	Units	10427767003		Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers			
		Result	Conc.								
Antimony, Dissolved	ug/L	ND	100	100	105	105	70-130				
Arsenic, Dissolved	ug/L	ND	100	100	106	106	70-130				
Beryllium, Dissolved	ug/L	ND	100	100	115	115	70-130				
Boron, Dissolved	ug/L	11.5	100	100	124	113	70-130				
Cadmium, Dissolved	ug/L	ND	100	100	104	104	70-130				
Chromium, Dissolved	ug/L	ND	100	100	109	109	70-130				
Cobalt, Dissolved	ug/L	ND	100	100	110	110	70-130				
Lead, Dissolved	ug/L	ND	100	100	110	110	70-130				
Selenium, Dissolved	ug/L	ND	100	100	109	109	70-130				
Thallium, Dissolved	ug/L	ND	100	100	109	109	70-130				
Uranium-238, Dissolved	ug/L	ND	100	100	108	108	70-130				
Vanadium, Dissolved	ug/L	ND	100	100	107	107	70-130				

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533263 Analysis Method: EPA 524.2
QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV
Associated Lab Samples: 10427826001

METHOD BLANK: 2896754 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/19/18 12:52	
1,2-Dichloroethane-d4 (S)	%	100	75-125	04/19/18 12:52	
4-Bromofluorobenzene (S)	%	96	75-125	04/19/18 12:52	
Toluene-d8 (S)	%	95	75-125	04/19/18 12:52	

LABORATORY CONTROL SAMPLE & LCSD: 2896755

Parameter	Units	2897075		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Total Trihalomethanes (Calc.)	ug/L	80	79.9	77.2	100	96	70-130	3	20
1,2-Dichloroethane-d4 (S)	%				100	100	75-125		
4-Bromofluorobenzene (S)	%				96	97	75-125		
Toluene-d8 (S)	%				96	97	75-125		

MATRIX SPIKE SAMPLE: 2897077

Parameter	Units	10427761007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%				100	75-125	
4-Bromofluorobenzene (S)	%				97	75-125	
Toluene-d8 (S)	%				96	75-125	

SAMPLE DUPLICATE: 2897076

Parameter	Units	60268271001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichloroethane-d4 (S)	%	102	102	0		
4-Bromofluorobenzene (S)	%	98	95	3		
Toluene-d8 (S)	%	95	96	0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 442244 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10427826001

METHOD BLANK: 2399870 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/25/18 07:43	

LABORATORY CONTROL SAMPLE: 2399871

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	55.6	111	64-137	

LABORATORY CONTROL SAMPLE: 2399872

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	7.7J	85	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400302 2400303

Parameter	Units	35387642002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	34.7	42.5	69	85	64-137	20	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401760 2401761

Parameter	Units	35387858001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	43.1	33.6	86	67	64-137	25	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 442497 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10427826001

METHOD BLANK: 2400903 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/25/18 12:31	
Paraquat	ug/L	ND	0.40	04/25/18 12:31	

LABORATORY CONTROL SAMPLE: 2400904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.8	92	70-130	
Paraquat	ug/L	2	1.7	85	70-130	

LABORATORY CONTROL SAMPLE: 2400905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.59	147	50-150	
Paraquat	ug/L	.4	0.42	105	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401428 2401429

Parameter	Units	35387355001 Result	MS Spike Conc.	MSD Spike Conc.	2401428		2401429		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.0	1.9	98	93	70-130	6	30	
Paraquat	ug/L	<0.30	2	2	1.8	1.6	90	82	70-130	9	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401430 2401431

Parameter	Units	35387355002 Result	MS Spike Conc.	MSD Spike Conc.	2401430		2401431		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.1	2.1	103	107	70-130	4	30	
Paraquat	ug/L	<0.30	2	2	1.9	1.9	94	93	70-130	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 442194 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10427826001

METHOD BLANK: 2399650 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
Dichloroacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
Haloacetic Acids (Total)	ug/L	ND	1.0	04/26/18 00:24	
Monobromoacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
Monochloroacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
Trichloroacetic Acid	ug/L	ND	1.0	04/26/18 00:24	
2,3-Dibromopropanoic Acid (S)	%	120	70-130	04/26/18 00:24	

LABORATORY CONTROL SAMPLE: 2399651

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	11.9	119	70-130	
Dichloroacetic Acid	ug/L	10	10.4	104	70-130	
Haloacetic Acids (Total)	ug/L	50	53.8	108	70-130	
Monobromoacetic Acid	ug/L	10	10.6	106	70-130	
Monochloroacetic Acid	ug/L	10	10.2	102	70-130	
Trichloroacetic Acid	ug/L	10	10.6	106	70-130	
2,3-Dibromopropanoic Acid (S)	%			123	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400101 2400102

Parameter	Units	2074668001		2400101		2400102		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec						
Dibromoacetic Acid	ug/L	ND	10	10	11.0	13.1	105	126	70-130	17	30		
Dichloroacetic Acid	ug/L	1.1	10	10	12.4	11.9	113	108	70-130	4	30		
Haloacetic Acids (Total)	ug/L	1.5	50	50	58.6	59.2	114	115	70-130	1	30		
Monobromoacetic Acid	ug/L	ND	10	10	11.7	11.0	117	110	70-130	6	30		
Monochloroacetic Acid	ug/L	ND	10	10	12.6	12.3	126	123	70-130	3	30		
Trichloroacetic Acid	ug/L	ND	10	10	10.9	11.0	109	110	70-130	1	30		
2,3-Dibromopropanoic Acid (S)	%						106	116	70-130		30		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400103 2400104

Parameter	Units	10427826001		2400103		2400104		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec						
Dibromoacetic Acid	ug/L	ND	10	10	12.6	13.1	126	131	70-130	4	30	M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Parameter	Units	2400103		2400104		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Dichloroacetic Acid	ug/L	ND	10	10	11.9	11.5	119	115	70-130	3	30		
Haloacetic Acids (Total)	ug/L	5.0	50	50	59.8	57.9	110	106	70-130	3	30		
Monobromoacetic Acid	ug/L	ND	10	10	11.4	10.7	114	107	70-130	7	30		
Monochloroacetic Acid	ug/L	5.0	10	10	11.8	10.2	68	52	70-130	15	30	M1	
Trichloroacetic Acid	ug/L	ND	10	10	12.1	12.3	121	123	70-130	2	30		
2,3-Dibromopropanoic Acid (S)	%						98	111	70-130		30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 534073 Analysis Method: EPA 8011
 QC Batch Method: EPA 8011 Analysis Description: GCS 8011 EDB DBCP
 Associated Lab Samples: 10427826001

METHOD BLANK: 2901365 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

Parameter	Units	2901367								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533542 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10427826001

METHOD BLANK: 2898180 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDE	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDT	ug/L	ND	0.10	04/25/18 19:54	
Aldrin	ug/L	ND	0.050	04/25/18 19:54	
alpha-BHC	ug/L	ND	0.050	04/25/18 19:54	
alpha-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
beta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Chlordane (Technical)	ug/L	ND	0.50	04/25/18 19:54	
delta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Dieldrin	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan I	ug/L	ND	0.050	04/25/18 19:54	
Endosulfan II	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan sulfate	ug/L	ND	0.10	04/25/18 19:54	
Endrin	ug/L	ND	0.10	04/25/18 19:54	
Endrin aldehyde	ug/L	ND	0.10	04/25/18 19:54	
Endrin ketone	ug/L	ND	0.10	04/25/18 19:54	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/25/18 19:54	
gamma-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor epoxide	ug/L	ND	0.050	04/25/18 19:54	
Methoxychlor	ug/L	ND	0.50	04/25/18 19:54	
Toxaphene	ug/L	ND	1.5	04/25/18 19:54	
Decachlorobiphenyl (S)	%	75	30-143	04/25/18 19:54	
Tetrachloro-m-xylene (S)	%	80	62-125	04/25/18 19:54	

LABORATORY CONTROL SAMPLE & LCSD: 2898181

Parameter	Units	2898182							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	0.95	104	95	67-125	10	20		
4,4'-DDE	ug/L	1	1.0	0.90	100	90	68-125	11	20		
4,4'-DDT	ug/L	1	0.92	0.83	92	83	66-125	10	20		
Aldrin	ug/L	.5	0.21	0.17	42	34	46-125	21	20	L2,R1	
alpha-BHC	ug/L	.5	0.50	0.45	101	90	66-125	11	20		
alpha-Chlordane	ug/L	.5	0.49	0.43	97	86	72-125	12	20		
beta-BHC	ug/L	.5	0.49	0.45	99	89	72-125	10	20		
delta-BHC	ug/L	.5	0.42	0.37	83	75	37-141	11	20		
Dieldrin	ug/L	1	1.1	1.0	112	100	71-125	11	20		
Endosulfan I	ug/L	.5	0.48	0.43	96	86	69-125	10	20		
Endosulfan II	ug/L	1	1.1	0.98	108	98	73-125	10	20		
Endosulfan sulfate	ug/L	1	0.96	0.87	96	87	63-127	9	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Parameter	Units	2898181		2898182			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	0.92	103	92	72-125	11	20	
Endrin aldehyde	ug/L	1	1.0	0.92	101	92	70-125	10	20	
Endrin ketone	ug/L	1	1.1	0.98	108	98	72-127	10	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.45	101	91	69-125	11	20	
gamma-Chlordane	ug/L	.5	0.43	0.38	86	75	64-125	14	20	
Heptachlor	ug/L	.5	0.34	0.28	67	57	54-125	17	20	
Heptachlor epoxide	ug/L	.5	0.50	0.45	101	90	72-125	11	20	
Methoxychlor	ug/L	5	4.6	4.2	92	84	67-127	9	20	
Decachlorobiphenyl (S)	%				80	76	30-143			
Tetrachloro-m-xylene (S)	%				85	70	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533544	Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C	Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10427826001	

METHOD BLANK: 2898185 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/23/18 14:24	
Decachlorobiphenyl (S)	%	105	30-125	04/23/18 14:24	CH
Tetrachloro-m-xylene (S)	%	50	30-125	04/23/18 14:24	

LABORATORY CONTROL SAMPLE & LCSD: 2898186

2898187

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.1	1.5	55	73	47-125	28	20	R1
PCB-1260 (Aroclor 1260)	ug/L	2	1.2	1.7	62	84	54-125	30	20	R1
Decachlorobiphenyl (S)	%				78	103	30-125			CH
Tetrachloro-m-xylene (S)	%				46	60	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533322 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10427826001

METHOD BLANK: 2897016 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,2-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,2-Diphenylhydrazine	ug/L	ND	10.0	04/23/18 13:12	
1,3-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1,4-Dichlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
1-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2,4,5-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dichlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dimethylphenol	ug/L	ND	50.0	04/23/18 13:12	
2,4-Dinitrophenol	ug/L	ND	10.0	04/23/18 13:12	
2,4-Dinitrotoluene	ug/L	ND	10.0	04/23/18 13:12	
2,6-Dinitrotoluene	ug/L	ND	10.0	04/23/18 13:12	
2-Chloronaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Chlorophenol	ug/L	ND	10.0	04/23/18 13:12	
2-Methylnaphthalene	ug/L	ND	10.0	04/23/18 13:12	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/23/18 13:12	
2-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
2-Nitrophenol	ug/L	ND	10.0	04/23/18 13:12	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/23/18 13:12	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/23/18 13:12	
3-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
4,6-Dinitro-2-methylphenol	ug/L	ND	10.0	04/23/18 13:12	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
4-Chloro-3-methylphenol	ug/L	ND	10.0	04/23/18 13:12	
4-Chloroaniline	ug/L	ND	50.0	04/23/18 13:12	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	04/23/18 13:12	
4-Nitroaniline	ug/L	ND	10.0	04/23/18 13:12	
4-Nitrophenol	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthene	ug/L	ND	10.0	04/23/18 13:12	
Acenaphthylene	ug/L	ND	10.0	04/23/18 13:12	
Anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)anthracene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(a)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(b)fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(g,h,i)perylene	ug/L	ND	10.0	04/23/18 13:12	
Benzo(k)fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Chloroisopropyl) ether	ug/L	ND	10.0	04/23/18 13:12	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/23/18 13:12	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

METHOD BLANK: 2897016

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Carbazole	ug/L	ND	10.0	04/23/18 13:12	
Chrysene	ug/L	ND	10.0	04/23/18 13:12	
Di-n-butylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Di-n-octylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dibenz(a,h)anthracene	ug/L	ND	10.0	04/23/18 13:12	
Dibenzofuran	ug/L	ND	10.0	04/23/18 13:12	
Diethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Dimethylphthalate	ug/L	ND	10.0	04/23/18 13:12	
Fluoranthene	ug/L	ND	10.0	04/23/18 13:12	
Fluorene	ug/L	ND	10.0	04/23/18 13:12	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	04/23/18 13:12	
Hexachlorobenzene	ug/L	ND	10.0	04/23/18 13:12	
Hexachloroethane	ug/L	ND	10.0	04/23/18 13:12	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10.0	04/23/18 13:12	
Isophorone	ug/L	ND	10.0	04/23/18 13:12	
N-Nitroso-di-n-propylamine	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/23/18 13:12	
N-Nitrosodiphenylamine	ug/L	ND	10.0	04/23/18 13:12	
Naphthalene	ug/L	ND	10.0	04/23/18 13:12	
Nitrobenzene	ug/L	ND	10.0	04/23/18 13:12	
Pentachlorophenol	ug/L	ND	20.0	04/23/18 13:12	
Phenanthrene	ug/L	ND	10.0	04/23/18 13:12	
Phenol	ug/L	ND	10.0	04/23/18 13:12	
Pyrene	ug/L	ND	10.0	04/23/18 13:12	
2,4,6-Tribromophenol (S)	%	100	65-125	04/23/18 13:12	
2-Fluorobiphenyl (S)	%	85	56-125	04/23/18 13:12	
2-Fluorophenol (S)	%	90	55-125	04/23/18 13:12	
Nitrobenzene-d5 (S)	%	87	60-125	04/23/18 13:12	
p-Terphenyl-d14 (S)	%	105	58-125	04/23/18 13:12	
Phenol-d6 (S)	%	91	58-125	04/23/18 13:12	

LABORATORY CONTROL SAMPLE & LCSD: 2897017

2897018

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	50	43.4	41.0	87	82	54-125	6	20	
1,2-Dichlorobenzene	ug/L	50	42.4	40.5	85	81	35-125	4	20	
1,2-Diphenylhydrazine	ug/L	50	46.0	44.0	92	88	68-125	4	20	
1,3-Dichlorobenzene	ug/L	50	41.3	40.1	83	80	30-125	3	20	
1,4-Dichlorobenzene	ug/L	50	41.1	40.4	82	81	33-125	2	20	
1-Methylnaphthalene	ug/L	50	45.7	43.8	91	88	67-125	4	20	
2,4,5-Trichlorophenol	ug/L	50	47.5	45.2	95	90	74-125	5	20	
2,4,6-Trichlorophenol	ug/L	50	47.6	46.1	95	92	74-125	3	20	
2,4-Dichlorophenol	ug/L	50	46.2	45.8	92	92	68-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

LABORATORY CONTROL SAMPLE & LCSD: 2897017		2897018									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4-Dimethylphenol	ug/L	50	36.7J	33.2J	73	66	33-125		20		
2,4-Dinitrophenol	ug/L	50	44.2	49.6	88	99	30-127	12	20		
2,4-Dinitrotoluene	ug/L	50	56.5	54.7	113	109	75-125	3	20		
2,6-Dinitrotoluene	ug/L	50	52.6	51.2	105	102	75-125	3	20		
2-Chloronaphthalene	ug/L	50	46.9	45.4	94	91	70-125	3	20		
2-Chlorophenol	ug/L	50	42.5	40.8	85	82	61-125	4	20		
2-Methylnaphthalene	ug/L	50	45.8	43.0	92	86	67-125	6	20		
2-Methylphenol(o-Cresol)	ug/L	50	43.3	40.4	87	81	63-125	7	20		
2-Nitroaniline	ug/L	50	47.4	45.8	95	92	73-125	3	20		
2-Nitrophenol	ug/L	50	48.1	46.0	96	92	64-125	4	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.9	42.1	88	84	67-125	4	20		
3,3'-Dichlorobenzidine	ug/L	50	55.6	52.5	111	105	60-125	6	20		
3-Nitroaniline	ug/L	50	55.7	53.3	111	107	73-125	4	20		
4,6-Dinitro-2-methylphenol	ug/L	50	55.3	56.3	111	113	42-127	2	20	2M	
4-Bromophenylphenyl ether	ug/L	50	48.0	46.6	96	93	75-125	3	20		
4-Chloro-3-methylphenol	ug/L	50	49.9	47.0	100	94	75-125	6	20		
4-Chloroaniline	ug/L	50	43.9J	41J	88	82	60-125		20		
4-Chlorophenylphenyl ether	ug/L	50	48.7	47.0	97	94	74-125	4	20		
4-Nitroaniline	ug/L	50	48.4	47.5	97	95	69-125	2	20		
4-Nitrophenol	ug/L	50	46.6	45.7	93	91	62-125	2	20		
Acenaphthene	ug/L	50	47.1	45.3	94	91	74-125	4	20		
Acenaphthylene	ug/L	50	47.1	45.2	94	90	72-125	4	20		
Anthracene	ug/L	50	48.4	46.0	97	92	75-125	5	20		
Benzo(a)anthracene	ug/L	50	49.4	48.5	99	97	75-125	2	20		
Benzo(a)pyrene	ug/L	50	48.6	47.8	97	96	75-125	2	20		
Benzo(b)fluoranthene	ug/L	50	49.8	48.3	100	97	75-125	3	20		
Benzo(g,h,i)perylene	ug/L	50	51.0	49.5	102	99	73-125	3	20		
Benzo(k)fluoranthene	ug/L	50	49.3	48.2	99	96	75-125	2	20		
bis(2-Chloroethoxy)methane	ug/L	50	44.6	42.9	89	86	67-125	4	20		
bis(2-Chloroethyl) ether	ug/L	50	39.9	37.8	80	76	55-125	5	20		
bis(2-Chloroisopropyl) ether	ug/L	50	34.7	33.2	69	66	52-125	5	20	2M	
bis(2-Ethylhexyl)phthalate	ug/L	50	55.2	54.2	110	108	72-129	2	20		
Butylbenzylphthalate	ug/L	50	54.4	51.4	109	103	69-127	6	20		
Carbazole	ug/L	50	50.4	48.2	101	96	75-125	4	20		
Chrysene	ug/L	50	49.9	48.6	100	97	75-125	3	20		
Di-n-butylphthalate	ug/L	50	53.2	50.5	106	101	75-125	5	20		
Di-n-octylphthalate	ug/L	50	56.1	54.8	112	110	69-131	2	20		
Dibenz(a,h)anthracene	ug/L	50	52.1	51.1	104	102	74-125	2	20		
Dibenzofuran	ug/L	50	48.8	46.3	98	93	75-125	5	20		
Diethylphthalate	ug/L	50	50.4	49.0	101	98	75-125	3	20		
Dimethylphthalate	ug/L	50	50.6	49.1	101	98	75-125	3	20		
Fluoranthene	ug/L	50	50.0	48.2	100	96	75-125	4	20		
Fluorene	ug/L	50	47.8	46.5	96	93	75-125	3	20		
Hexachloro-1,3-butadiene	ug/L	50	42.8	41.1	86	82	37-125	4	20		
Hexachlorobenzene	ug/L	50	49.3	47.2	99	94	74-125	4	20		
Hexachloroethane	ug/L	50	42.8	40.0	86	80	30-125	7	20		
Indeno(1,2,3-cd)pyrene	ug/L	50	51.3	50.3	103	101	74-125	2	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Parameter	Units	2897017		2897018		% Rec	LCS	LCS	% Rec	Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCS Result	% Rec								
Isophorone	ug/L	50	45.7	42.8	91	86	72-125	7	20				
N-Nitroso-di-n-propylamine	ug/L	50	43.0	42.3	86	85	65-125	2	20				
N-Nitrosodimethylamine	ug/L	50	42.8	39.7	86	79	52-125	7	20				
N-Nitrosodiphenylamine	ug/L	50	49.5	47.5	99	95	75-125	4	20				
Naphthalene	ug/L	50	43.8	41.5	88	83	58-125	5	20				
Nitrobenzene	ug/L	50	43.1	40.2	86	80	64-125	7	20				
Pentachlorophenol	ug/L	50	42.8	40.6	86	81	52-125	5	20				
Phenanthrene	ug/L	50	47.3	45.6	95	91	75-125	4	20				
Phenol	ug/L	50	41.4	40.1	83	80	59-125	3	20				
Pyrene	ug/L	50	50.4	49.0	101	98	75-125	3	20				
2,4,6-Tribromophenol (S)	%				95	91	65-125						
2-Fluorobiphenyl (S)	%				80	74	56-125						
2-Fluorophenol (S)	%				76	72	55-125						
Nitrobenzene-d5 (S)	%				77	72	60-125						
p-Terphenyl-d14 (S)	%				95	92	58-125						
Phenol-d6 (S)	%				76	73	58-125						

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 20900

Analysis Method: EPA 8315A

QC Batch Method: EPA 8315A

Analysis Description: 8315 GCSV Aldehydes

Associated Lab Samples: 10427826001

METHOD BLANK: 83416

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/21/18 11:17	

LABORATORY CONTROL SAMPLE: 83417

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	358	90	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 83418

83419

Parameter	Units	10427644001		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	ND	Spike Conc.	MS Conc.	Spike Conc.	MS Conc.	MSD Result	MSD Result	% Rec	% Rec			
Formaldehyde	ug/L	ND	ND	400	400	400	400	360	369	87	90	35-167	3	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 535040 Analysis Method: EPA 1664A OG
QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
Associated Lab Samples: 10427826001

METHOD BLANK: 2907049 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	04/30/18 10:26	

LABORATORY CONTROL SAMPLE: 2907050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	35.4	88	78-114	

MATRIX SPIKE SAMPLE: 2907051

Parameter	Units	40167949002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	138	37.4	172	91	78-114	

SAMPLE DUPLICATE: 2907052

Parameter	Units	40167949003 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	51.2	37.1	32	18	D6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533246	Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1	Analysis Description: 180.1 Turbidity
Associated Lab Samples: 10427826001	

METHOD BLANK: 2896682 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/19/18 10:52	

LABORATORY CONTROL SAMPLE: 2896683

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.5	103	90-110	

SAMPLE DUPLICATE: 2896684

Parameter	Units	10427826001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	620	715	14	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533988	Analysis Method: SM 2540D
QC Batch Method: SM 2540D	Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 10427826001	

METHOD BLANK: 2900534 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/24/18 16:10	

LABORATORY CONTROL SAMPLE: 2900535

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	92.0	92	80-120	

SAMPLE DUPLICATE: 2900536

Parameter	Units	10427930005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	107	105	2	10	

SAMPLE DUPLICATE: 2900537

Parameter	Units	10427930006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	13.0	14.0	7	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 534745	Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B	Analysis Description: 4500H+B pH
Associated Lab Samples: 10427826001	

LABORATORY CONTROL SAMPLE: 2905104

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2905105

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.0	1	3	H6

SAMPLE DUPLICATE: 2905106

Parameter	Units	10427668001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533253 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10427826001

METHOD BLANK: 2896722 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/19/18 11:32	
Fluoride	mg/L	ND	0.050	04/19/18 11:32	

LABORATORY CONTROL SAMPLE: 2896723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Fluoride	mg/L	1	0.92	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896724 2896725

Parameter	Units	10427232002		2896724		2896725		% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	0.32J	12.5	12.5	12.0	12.0	94	93	90-110	0	20		
Fluoride	mg/L	<0.0028	1	1	1.0	0.94	103	94	90-110	9	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 442384	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427826001	

METHOD BLANK: 2400473 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/24/18 13:17	

LABORATORY CONTROL SAMPLE: 2400474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	38.8	97	85-115	

MATRIX SPIKE SAMPLE: 2400476

Parameter	Units	10427826001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	4000	2770	69	75-125	M6

SAMPLE DUPLICATE: 2400475

Parameter	Units	10427826001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 442385	Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1	Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10427826001	

METHOD BLANK: 2400477 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/24/18 13:17	

LABORATORY CONTROL SAMPLE: 2400478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	7.7	96	85-115	

MATRIX SPIKE SAMPLE: 2400480

Parameter	Units	10427826001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	82.3	103	75-125	

SAMPLE DUPLICATE: 2400479

Parameter	Units	10427826001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 533227 Analysis Method: SM 3500-Cr B Modified
 QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
 Associated Lab Samples: 10427826001

METHOD BLANK: 2896588 Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/19/18 10:10	FS

LABORATORY CONTROL SAMPLE: 2896589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2896590 2896591

Parameter	Units	10427826001		2896590		2896591		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chromium, Hexavalent	mg/L	ND	.2	.2	.0049J	.006J	1	1	85-115	20	FS,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch:	141158	Analysis Method:	EPA 350.1
QC Batch Method:	EPA 350.1	Analysis Description:	350.1 Ammonia Undistilled
Associated Lab Samples:	10427826001		

METHOD BLANK: 558442 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/24/18 10:34	

LABORATORY CONTROL SAMPLE: 558443

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2	2.0	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 558444 558445

Parameter	Units	12107404003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	2	2	2.0	2.0	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 558446 558447

Parameter	Units	12107406003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	2	2	2.0	2.0	98	99	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 533564 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 10427826001

METHOD BLANK: 2898336 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/20/18 14:00	FS
Nitrite as N	mg/L	ND	0.020	04/20/18 14:00	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/20/18 14:00	FS

LABORATORY CONTROL SAMPLE: 2898337

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	100	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.98	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898338 2898339

Parameter	Units	10428032002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Nitrite as N	mg/L	0.027	1	1	0.90	0.92	87	89	90-110	2	20	FS,M1	
Nitrogen, NO2 plus NO3	mg/L	0.11	1	1	0.92	0.95	81	85	90-110	4	20	FS,M1	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 21104 Analysis Method: EPA 9016
QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
Associated Lab Samples: 10427826001

METHOD BLANK: 84163 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/24/18 17:31	

LABORATORY CONTROL SAMPLE: 84164

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	148	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84165 84166

Parameter	Units	10427352003		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Cyanide, Free	ug/L	ND	150	150	142	143	95	95	80-120	1	11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water
Pace Project No.: 10427826

QC Batch: 534468 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10427826001

METHOD BLANK: 2903673 Matrix: Water
Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/27/18 09:57	

LABORATORY CONTROL SAMPLE: 2903674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	258	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903675 2903676

Parameter	Units	10428172001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	10.1	250	250	238	242	91	93	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903677 2903678

Parameter	Units	10428174001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	10.6	250	250	241	242	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 534444

Analysis Method: SM 4500-P E

QC Batch Method: SM 4500-P B

Analysis Description: SM4500P-E, Total Phosphorus

Associated Lab Samples: 10427826001

METHOD BLANK: 2903593

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	04/27/18 12:18	

LABORATORY CONTROL SAMPLE: 2903594

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903595 2903596

Parameter	Units	10428297001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.068	1	1	1.0	1.1	98	101	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903597 2903598

Parameter	Units	10428298001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.098	1	1	1.1	1.1	99	100	80-120	1	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Sample: FL-TT-02 **Lab ID: 10427826001** Collected: 04/18/18 15:15 Received: 04/18/18 17:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	7.56 ± 2.61 (2.75) C:NA T:NA	pCi/L	05/07/18 18:53	12587-46-1	
Gross Beta	EPA 900.0	9.79 ± 3.19 (4.31) C:NA T:NA	pCi/L	05/07/18 18:53	12587-47-2	
Radium-226	EPA 903.1	0.343 ± 0.357 (0.531) C:NA T:88%	pCi/L	05/07/18 21:44	13982-63-3	
Radium-228	EPA 904.0	1.46 ± 0.878 (1.64) C:49% T:65%	pCi/L	05/10/18 15:16	15262-20-1	
Total Radium	Total Radium Calculation	1.80 ± 1.24 (2.17)	pCi/L	05/11/18 11:36	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 295983

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10427826001

METHOD BLANK: 1449055

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.112 ± 0.312 (0.605) C:NA T:94%	pCi/L	05/07/18 21:03	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

QC Batch: 296837

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10427826001

METHOD BLANK: 1452799

Matrix: Water

Associated Lab Samples: 10427826001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.190 ± 0.373 (1.32) C:NA T:NA	pCi/L	05/08/18 08:26	
Gross Beta	-0.136 ± 0.558 (1.49) C:NA T:NA	pCi/L	05/08/18 08:26	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10427826

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 533263

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

BATCH QUALIFIERS

Batch: 533719

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533817

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533882

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534052

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 535040

[BE] Batch extracted by solid phase extraction (SPE).

ANALYTE QUALIFIERS

1M Sample was brown in color.

2M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

FS The sample was filtered in the laboratory prior to analysis.

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

S4 Surrogate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427826001	FL-TT-02				
10427826001	FL-TT-02	EPA 531.1	444330		
10427826001	FL-TT-02	EPA 547	443433		
10427826001	FL-TT-02	EPA 549.2	442497	EPA 549.2	442774
10427826001	FL-TT-02	EPA 552.3	442194	EPA 552.3	442372
10427826001	FL-TT-02	EPA 8011	534073	EPA 8011	534336
10427826001	FL-TT-02	EPA 8015 Alcohol-Glycol	438905		
10427826001	FL-TT-02	EPA 8015 Alcohol-Glycol	438205		
10427826001	FL-TT-02	EPA Mod. 3510C	533542	EPA 8081B	534052
10427826001	FL-TT-02	EPA Mod. 3510C	533544	EPA 8082A	533719
10427826001	FL-TT-02	EPA 8315A	20900	EPA 8315A	20933
10427826001	FL-TT-02	EPA 8316	21113		
10427826001	FL-TT-02	EPA 200.7	533435	EPA 200.7	534229
10427826001	FL-TT-02	EPA 200.8	533161	EPA 200.8	533533
10427826001	FL-TT-02	EPA 200.8	533428	EPA 200.8	533889
10427826001	FL-TT-02	EPA 245.1	533449	EPA 245.1	533882
10427826001	FL-TT-02	EPA 548.1	442244	EPA 548.1	442522
10427826001	FL-TT-02	EPA 3520	533322	EPA 8270D	533817
10427826001	FL-TT-02	EPA 524.2	533263		
10427826001	FL-TT-02				
10427826001	FL-TT-02	EPA 900.0	296837		
10427826001	FL-TT-02	EPA 903.1	295983		
10427826001	FL-TT-02	EPA 904.0	295999		
10427826001	FL-TT-02	Total Radium Calculation	298015		
10427826001	FL-TT-02	Hach 10360	533231	Hach 10360 Rev 1.1	533509
10427826001	FL-TT-02	EPA 1664A OG	535040		
10427826001	FL-TT-02	EPA 180.1	533246		
10427826001	FL-TT-02	SM 2540D	533988		
10427826001	FL-TT-02	SM 4500-CIO2	442752		
10427826001	FL-TT-02	SM 4500-H+B	534745		
10427826001	FL-TT-02	Trivalent Chromium Calculation	534084		
10427826001	FL-TT-02	EPA 300.0	533253		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE


Project: 18-00383 MPCA-Freeway LF Water

Pace Project No.: 10427826

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10427826001	FL-TT-02	EPA 300.1	442384		
10427826001	FL-TT-02	EPA 300.1	442385		
10427826001	FL-TT-02	SM 3500-Cr B Modified	533227		
10427826001	FL-TT-02	EPA 350.1			
10427826001	FL-TT-02	EPA 350.1	141158		
10427826001	FL-TT-02	EPA 353.2	533564		
10427826001	FL-TT-02	EPA 9016	21104	EPA 9016	21181
10427826001	FL-TT-02	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10427826001	FL-TT-02	SM 4500-P B	534444	SM 4500-P E	534526

REPORT OF LABORATORY ANALYSIS

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	Document Name: Sample Condition Upon Receipt Form	Document Revised: 14Dec2017 Page 1 of 2
	Document No.: F-MN-L-213-rev.22	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: MPCA

Project #:

WO# : 10427826

PM: JMA Due Date: 05/03/18
CLIENT PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Used: G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 5.4, 6.0 Cooler Temp Corrected (°C): 5.6, 6.2 Biological Tissue Frozen? Yes No N/A

Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: MD 4/18/18

USDA Regulated Soil N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>No time on samples</u>
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Exceptions: <u>VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y Sample # <u>1; 5/5</u> <u>1/1</u> <u>1/1</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/19/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury - Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

**** ADD to Parameter List A:**

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 8011
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMs)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothal	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Sample Condition Upon Receipt

Client Name: Pace MRI

Project #:

WO# : 10427826

PM: JMA Due Date: 05/03/18
 CLIENT: **PASI-MNFLD**

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 687A9155100842
 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: none Date and Initials of Person Examining Contents: ms 4/25/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>Return Samples</u>
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>Wt</u>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1</u>
Head-space in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION:

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/26/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

WO#: 12107380



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427826 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To		Subcontract To					Requested Analysis																			
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					Nitrogen, unionized ammonia, as N																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4	Preserved Containers				LAB USE ONLY															
1	FL-TT-02	PS	4/18/2018 15:15	10427826001	Water	1																				
2																										
3																										
4																										
5																										
Transfers																										
Released By	Date/Time	Received By	Date/Time	Comments																						
<i>Myra J. Pace</i>	4/19/18 17:10	<i>Cliff</i>	4-19-18 19:30																							
<i>R. Chase</i>	4/20/18 0:30	<i>B. Mathem</i>	4/20/18 06:45																							
3																										
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																				
5.4 °C		☑ or N		☑ or N		☑ or N																				

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
 F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN
 Project #:

WO#: 12107380
 PM: HRZ Due Date: 05/02/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Optional: Proj. Due Date: _____ Proj. Name: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.1 Cooler Temp Corrected °C: 5.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: 4-20-18 DC

Comments: Bom 4/20/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Carrin Jensen Date: 4/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project # WO# : 35387603
Project Manager: PM: ADC **Due Date:** 05/01/18
Client: CLIENT: PACMIN

Date and Initials of person:
 Examining contents: _____
 Label: AKB
 Deliver: _____
 pH: _____

Thermometer Used: T338 Date: 4/20/18 Time: 1105 Initials: KBI

State of Origin: _____
 Cooler #1 Temp. °C 2.1 (Visual) 0 (Correction Factor) 2.1 (Actual) Samples on ice, cooling process has begun
 Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
 Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
 Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
 Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
 Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
 Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832 2460

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No Ice: Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) Shorted Date: _____ Shorted Time: _____ Qty: _____

		Comments:
Chain of Custody Present	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____

Comments/ Resolution (use back for additional comments):

Project Manager Review: Aaron Crump

Date: 04/20/18

SAMPLE RECEIVING / LOG-IN CHECKLIST



Client: <u>Pace</u>	Work Order #:
Receipt Record Page/Line #	

Recorded by (initials/date): <u>WC 4.20.18</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other	Qty Received: <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> IR Gun (#402)
---	--	---------------------------	---

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time				
<u>Pace</u>	<u>0915</u>										
Custody Seals: <input type="checkbox"/> None <input checked="" type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact					
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None					
Coolant Location: <input checked="" type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed <input type="checkbox"/> Top <input type="checkbox"/> Middle <input type="checkbox"/> Bottom					
Temp Blank Present: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Present, Temperature Blank Location is: <input checked="" type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative					
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C			
Temp Blank: <u>23</u>	<u>-</u>	<u>23</u>									
Sample 1: <u>40</u>	<u>-</u>	<u>40</u>									
Sample 2: <u>28</u>	<u>-</u>	<u>28</u>									
Sample 3: <u>3.7</u>	<u>-</u>	<u>3.7</u>									
When above 6 °C take a 3 Sample Average °C: _____			When above 6 °C take a 3 Sample Average °C: _____			When above 6 °C take a 3 Sample Average °C: _____			When above 6 °C take a 3 Sample Average °C: _____		
<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Chain of Custody record(s)? If No, Initiated By _____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Received for Lab Signed/Date/Time?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	USDA Soil Documents?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sampling / Field Forms?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Other _____

COC Information

Pace COC Other _____

COC ID Numbers:

Check COC for Accuracy

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Analysis Requested?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID matches COC?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample Date and Time matches COC?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	All containers indicated are received?

Sample Condition Summary

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Broken containers/lids?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Missing or incomplete labels?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Illegible information on labels?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low volume received?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inappropriate or non-Pace containers received?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	VOC vials have headspace?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extra sample locations?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Blank OR average sample temperature, ≥6 °C?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes" was thermal preservation required?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes" were ALL samples collected the same day as receipt?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Completed Sample Preservation Verification Form?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Samples chemically preserved correctly?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "No", add wire tag and fill out Non-Conformance Form?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Received unpreserved Terracore kit?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If "Yes" unpreserved vials must be frozen

Work Order Not Logged In with Short Hold / Rush

Copies of COC To Lab Areas

Notes

Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Were all samples logged into Epic?
<input type="checkbox"/>	<input type="checkbox"/>	Were all samples labelled?
<input type="checkbox"/>	<input type="checkbox"/>	Were samples placed on scan locations?

Initial / Date :



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50194900

Date/Time and Initials of person examining contents: JH 4-20-18 451

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2530

Custody Seal on Cooler/Box Present: Yes No **Seals Intact:** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F **Ice Type:** Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 2/2/2/5 **Ice Visible in Sample Containers?:** Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C **If temp. is Over 6°C or under 0°C, was the PM Notified?:** Yes No N/A

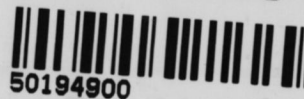
All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		X	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			X
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:	X		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	X		Dissolved Metals field filtered?:			X
Short Hold Time Analysis (<72hr)?: Analysis:		X	Headspace Wisconsin Sulfide			
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Rush TAT Requested:		X	Headspace in VOA Vials (>6mm):			X
Containers Intact?:	X		Trip Blank Present?:		X	
Sample Labels Match COC?: Except TCs, which only require sample ID	X		Trip Blank Custody Seals?:		X	

Comments:

Sample Container Count

WO#: 50194900



50194900

CLIENT: Pace MN

COC PAGE ___ of ___

COC ID# _____

Project # 50194900

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit	Matrix SI/ (Soil/Wat Aqueous	pH <2	pH >9	pH >12	
																		R					
1																		R	3	wt			
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
VGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
VGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
BGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10427826 Workorder Name: 18-00383 MPCA-Freeway LF Water Owner Received Date: 4/18/2018 Results Requested By: 5/3/2018

Report To		Subcontract To		Requested Analysis											
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600		<div style="text-align: right; font-size: 24pt; font-weight: bold;">WO# : 30250246</div> <div style="text-align: right; font-weight: bold;">30250246</div>											
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY
1	FL-TT-02	PS	4/18/2018 15:15	10427826001	Water	3					X	X	X	X	001
2															
3															
4															
5															
Transfers										Comments					
Released By	Date/Time	Received By	Date/Time												
<i>Wm J. Paul</i>	<i>4/19/18 15:35</i>	<i>John Brown</i>	<i>4/20/18 12:15</i>												
Cooler Temperature on Receipt <i>—</i> °C		Custody Seal Y or <i>N</i>		Received on Ice Y or <i>N</i>		Samples Intact <i>Y</i> or N									

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

30250246

Pace Analytical

Client Name: Pace MN

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 3470

Label	<u>DS</u>
LIMS Login	<u>BSH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature _____ Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DS 4-20-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>pH < 2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>BSH</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	/			17.
Trip Blank Present:	/			18.
Trip Blank Custody Seals Present	/			
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed: <u>BSH</u> Date: <u>4-20-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

May 03, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/20/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kari-Ann Killian For Jessica Esser
Project Manager

Certification List

Certification List			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

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1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427826
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-TT-02 (10427826001)	A181622-01	Water	04/18/2018	04/20/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/20/2018. Sample was received at 2.3 degrees Celsius. Sample was received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Sample Preparation:

Sample A181622-01 had to be run at a dilution factor of 1:2 for the MDA List 1 analysis, due to the sample matrix. The reporting limits have been raised accordingly and the sample is reported to the limit of detection.

Continuing Calibration Verification (CCV):

The LC footnote on sample A181622-01 states that there was a low CCV recovery for prometon. The lower control limit is 80% and the lowest recovery was 79.4%.

Surrogates:

The S qualifier on sample A181622-01 indicates that the triphenyl phosphate surrogate recovery was above acceptance criteria. Since the recovery was high and the sample was a non-detect for the associated analysis, data is deemed acceptable.

Matrix Spike / Matrix Spike Duplicates (MS/MSDs):

The M and M1 qualifier on chlorpyrifos and metolachlor for batch A804174 indicates a MS/MSD quality control exceedance. This failure could indicate an issue with sample heterogeneity. The parent sample for this quality control exceedance was not from this work order.



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427826
Project Manager: Jennifer Anderson

FL-TT-02 (10427826001)

Date Sampled

A181622-01 (Water)

04/18/2018 15:15

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804174

Acetochlor	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Alachlor	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Atrazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Chlorpyrifos	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Cyanazine	ND	0.40	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Desethylatrazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Deisopropylatrazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Dimethenamid	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
EPTC	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Ethalfuralin	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Fonofos	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Metolachlor	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Metribuzin	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Pendimethalin	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Phorate	ND	0.60	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Prometon	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	LC
Propachlor	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Propazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Simazine	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Terbufos	ND	0.40	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Triallate	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Trifluralin	ND	1.0	ug/L	2	04/20/2018	04/30/2018 17:45	EPA 8270D	
Surrogate: Atrazine-d5		77.4 %		65.1-122	04/20/2018	04/30/2018 17:45	EPA 8270D	
Surrogate: Parathion-d10		126 %		22.3-159	04/20/2018	04/30/2018 17:45	EPA 8270D	
Surrogate: Triphenyl phosphate		826 %		65.2-151	04/20/2018	04/30/2018 17:45	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804192

2,4-D	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/24/2018	04/24/2018 23:37	EPA 8151A	
Surrogate: 2,4-D-d5		85.8 %		44.2-121	04/24/2018	04/24/2018 23:37	EPA 8151A	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427826
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804174 - EPA 3510C

Blank (A804174-BLK1)

Prepared: 04/20/2018 Analyzed: 04/30/2018 16:21

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>92.4</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.0</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.557</i>		<i>ug/L</i>	<i>0.5000</i>		<i>111</i>	<i>65.2-151</i>			

LCS (A804174-BS1)

Prepared: 04/20/2018 Analyzed: 04/28/2018 15:32

Acetochlor	1.02	0.50	ug/L	1.000		102	67.5-120			
Alachlor	1.05	0.50	ug/L	1.000		105	71.7-120			
Atrazine	0.998	0.50	ug/L	1.000		99.8	72.8-113			
Chlorpyrifos	1.03	0.50	ug/L	1.000		103	65.3-119			
Cyanazine	1.19	0.20	ug/L	1.000		119	49.5-140			
Desethylatrazine	1.04	0.50	ug/L	1.000		104	66.9-116			
Deisopropylatrazine	0.849	0.50	ug/L	1.000		84.9	44.3-110			
Dimethenamid	1.05	0.50	ug/L	1.000		105	63.8-116			
EPTC	0.850	0.50	ug/L	1.000		85.0	41.7-102			
Ethalfuralin	0.769	0.50	ug/L	1.000		76.9	41-127			
Fonofos	0.917	0.50	ug/L	1.000		91.7	59.7-118			
Metolachlor	1.09	0.50	ug/L	1.000		109	71.7-122			
Metribuzin	1.02	0.50	ug/L	1.000		102	66.6-128			
Pendimethalin	1.03	0.50	ug/L	1.000		103	55.5-137			
Phorate	0.855	0.30	ug/L	1.000		85.5	41.2-114			
Prometon	1.07	0.50	ug/L	1.000		107	66.3-120			
Propachlor	0.998	0.50	ug/L	1.000		99.8	65.8-119			



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

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 1700 Elm Street, Suite 200
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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427826
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804174 - EPA 3510C

LCS (A804174-BS1)

Prepared: 04/20/2018 Analyzed: 04/28/2018 15:32

Propazine	1.05	0.50	ug/L	1.000		105	72-122			
Simazine	1.03	0.50	ug/L	1.000		103	72.8-113			
Terbufos	0.828	0.20	ug/L	1.000		82.8	38.6-115			
Triallate	0.899	0.50	ug/L	1.000		89.9	51.4-116			
Trifluralin	0.839	0.50	ug/L	1.000		83.9	46.1-134			
Surrogate: Atrazine-d5	0.482		ug/L	0.5000		96.3	65.1-122			
Surrogate: Parathion-d10	0.534		ug/L	0.5000		107	22.3-159			
Surrogate: Triphenyl phosphate	0.581		ug/L	0.5000		116	65.2-151			

Matrix Spike (A804174-MS1)

Source: A181619-03

Prepared: 04/20/2018 Analyzed: 05/01/2018 16:48

Acetochlor	2.09	0.50	ug/L	1.000	1.07	102	67.3-128			
Alachlor	1.23	0.50	ug/L	1.000	0.277	95.7	58.2-150			
Atrazine	1.95	0.50	ug/L	1.000	0.910	104	70.1-120			
Chlorpyrifos	1.21	0.50	ug/L	1.000	ND	121	73.3-118			M
Cyanazine	1.28	0.20	ug/L	1.000	ND	128	60.6-140			
Desethylatrazine	1.14	0.50	ug/L	1.000	ND	114	69.7-122			
Deisopropylatrazine	1.03	0.50	ug/L	1.000	ND	103	48-121			
Dimethenamid	3.43	0.50	ug/L	1.000	2.24	119	63.7-123			
EPTC	0.962	0.50	ug/L	1.000	0.103	85.8	58-109			
Ethalfluralin	0.903	0.50	ug/L	1.000	ND	90.3	59.3-129			
Fonofos	0.925	0.50	ug/L	1.000	ND	92.5	73.5-108			
Metolachlor	50.9	5.0	ug/L	1.000	58.9	NR	40.9-156			M1, D
Metribuzin	1.10	0.50	ug/L	1.000	ND	110	70.9-136			
Pendimethalin	1.18	0.50	ug/L	1.000	ND	118	55.4-155			
Phorate	0.988	0.30	ug/L	1.000	ND	98.8	60.2-108			
Prometon	1.13	0.50	ug/L	1.000	ND	113	74.7-124			
Propachlor	1.01	0.50	ug/L	1.000	ND	101	72.3-115			
Propazine	1.11	0.50	ug/L	1.000	ND	111	73.7-124			
Simazine	1.03	0.50	ug/L	1.000	ND	103	74.8-114			
Terbufos	0.932	0.20	ug/L	1.000	ND	93.2	56.1-114			
Triallate	0.986	0.50	ug/L	1.000	ND	98.6	65.5-107			
Trifluralin	0.948	0.50	ug/L	1.000	ND	94.8	58-149			
Surrogate: Atrazine-d5	0.449		ug/L	0.5000		89.8	65.1-122			
Surrogate: Parathion-d10	0.533		ug/L	0.5000		107	22.3-159			
Surrogate: Triphenyl phosphate	0.636		ug/L	0.5000		127	65.2-151			

Matrix Spike Dup (A804174-MSD1)

Source: A181619-03

Prepared: 04/20/2018 Analyzed: 05/01/2018 17:16

Acetochlor	2.09	0.50	ug/L	1.031	1.07	99.0	67.3-128	0.180	20	
Alachlor	1.28	0.50	ug/L	1.031	0.277	97.5	58.2-150	3.85	20	
Atrazine	1.82	0.50	ug/L	1.031	0.910	88.5	70.1-120	6.56	20	
Chlorpyrifos	1.23	0.50	ug/L	1.031	ND	119	73.3-118	1.49	20	M
Cyanazine	1.39	0.20	ug/L	1.031	ND	135	60.6-140	8.46	20	
Desethylatrazine	1.22	0.50	ug/L	1.031	ND	118	69.7-122	6.69	20	
Deisopropylatrazine	1.05	0.50	ug/L	1.031	ND	102	48-121	2.03	20	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
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Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427826
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804174 - EPA 3510C

Matrix Spike Dup (A804174-MSD1)	Source: A181619-03			Prepared: 04/20/2018 Analyzed: 05/01/2018 17:16						
Dimethenamid	3.45	0.50	ug/L	1.031	2.24	117	63.7-123	0.391	20	
EPTC	0.954	0.50	ug/L	1.031	0.103	82.5	58-109	0.808	20	
Ethalfuralin	0.903	0.50	ug/L	1.031	ND	87.6	59.3-129	0.00355	20	
Fonofos	0.926	0.50	ug/L	1.031	ND	89.8	73.5-108	0.0398	20	
Metolachlor	51.9	5.0	ug/L	1.031	58.9	NR	40.9-156	1.98	20	M1, D
Metribuzin	1.14	0.50	ug/L	1.031	ND	111	70.9-136	3.58	20	
Pendimethalin	1.27	0.50	ug/L	1.031	ND	123	55.4-155	7.17	20	
Phorate	1.00	0.30	ug/L	1.031	ND	97.4	60.2-108	1.56	20	
Prometon	1.19	0.50	ug/L	1.031	ND	116	74.7-124	5.59	20	
Propachlor	1.04	0.50	ug/L	1.031	ND	101	72.3-115	3.66	20	
Propazine	1.08	0.50	ug/L	1.031	ND	105	73.7-124	2.72	20	
Simazine	1.11	0.50	ug/L	1.031	ND	107	74.8-114	7.16	20	
Terbufos	0.936	0.20	ug/L	1.031	ND	90.8	56.1-114	0.443	20	
Triallate	0.967	0.50	ug/L	1.031	ND	93.8	65.5-107	1.99	20	
Trifluralin	0.968	0.50	ug/L	1.031	ND	93.9	58-149	2.05	20	
Surrogate: Atrazine-d5	0.494		ug/L	0.5155		95.7	65.1-122			
Surrogate: Parathion-d10	0.579		ug/L	0.5155		112	22.3-159			
Surrogate: Triphenyl phosphate	0.647		ug/L	0.5155		126	65.2-151			



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10427826
 Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch A804192 - EPA 3510C

Blank (A804192-BLK1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 07:56

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

2.11 ug/L 2.016 105 44.2-121

LCS (A804192-BS1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 04:58

2,4-D	1.70	0.50	ug/L	2.000		84.9	64.6-148			
2,4-DB	1.79	0.50	ug/L	2.000		89.7	66.7-143			
2,4,5-T	1.58	0.50	ug/L	2.000		79.1	63.4-133			
2,4,5-TP (Silvex)	1.69	0.50	ug/L	2.000		84.7	63-145			
Bentazon	0.901	0.50	ug/L	1.000		90.1	52.5-139			
Dicamba	1.54	0.50	ug/L	2.000		77.2	55.4-143			
MCPA	1.59	0.30	ug/L	2.000		79.7	33.5-143			
Picloram	0.849	0.50	ug/L	1.000		84.9	47.9-113			
Triclopyr	1.79	0.50	ug/L	2.000		89.7	65.1-141			

Surrogate: 2,4-D-d5

1.66 ug/L 2.016 82.4 44.2-121

LCS Dup (A804192-BSD1)

Prepared: 04/24/2018 Analyzed: 04/25/2018 11:48

2,4-D	1.76	0.50	ug/L	2.000		87.9	64.6-148	3.43	20	
2,4-DB	1.76	0.50	ug/L	2.000		88.1	66.7-143	1.81	20	
2,4,5-T	1.49	0.50	ug/L	2.000		74.4	63.4-133	6.16	20	
2,4,5-TP (Silvex)	1.73	0.50	ug/L	2.000		86.6	63-145	2.29	20	
Bentazon	0.811	0.50	ug/L	1.000		81.1	52.5-139	10.5	20	
Dicamba	1.63	0.50	ug/L	2.000		81.6	55.4-143	5.55	20	
MCPA	1.58	0.30	ug/L	2.000		79.2	33.5-143	0.648	20	
Picloram	0.712	0.50	ug/L	1.000		71.2	47.9-113	17.5	20	
Triclopyr	1.51	0.50	ug/L	2.000		75.4	65.1-141	17.3	20	

Surrogate: 2,4-D-d5

1.77 ug/L 2.016 87.7 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10427826
Project Manager: Jennifer Anderson

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

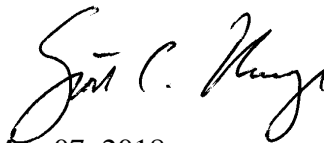
PaceProject#: 10427828
Sample Receipt Date: 04/18/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 07, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 7, 2018

DISCUSSION

This report presents the results from the analysis performed on one sample submitted by a representative of PACE Minnesota Field. The sample was analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration points and a nominal 1-liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The sample was received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extract was recovered at 81%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 102-107% with a relative percent difference of 4.8%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10427828

Appendix A

Sample Management

WO# 10427828



10427828

Report No.....10427828_1613TCDD_DFR

Chain-of-Custody Form

Work Order Number: COC Type: Page: 1 of

Turnaround Time: COC ID:

Minnesota Pollution Control Agency

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: MPLA - Free way LF water

Program Code (MDH Lab Only):

Lab Name:

Project Name: MPLA - Free way LF water

Project Task Code:

Address:

18-00393
EPIC Profile #38716

Project Manager:

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No:

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-VP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
Wt-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, feet	End Depth, feet	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Coats	ANALYSIS	Lab Sample No.	#	
FL-TT-02	S	4/18/18	15:15:10		10.5	G	NW	Wt-Ground			41	LIST A X	LIST B/C X	001	1
															2
															3
															4
															5
															6
															7
															8
															9
															10

NW
4/18/18

Sampled By: Nate Hubbard

Sampler's Signature: Nate Hubbard

Phone #: 612-214-8066

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) Nate Hubbard / Pace	4/18/18 1730	W. Pace	4/18/18 1730

1730
T=5.6
6.2

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO# : 10427828
 PH: SC/1 Due Date: 05/03/18
 CLIENT PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 G87A9155100842
 Used: _____ Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 5.4, 6.0 Cooler Temp Corrected (°C): 5.6, 6.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: MD 4/19/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>No time on sample</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased): _____	15.

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: Received during cool down phase.

Project Manager Review:

[Signature]

Date: 04/19/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10427828

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-02		
Lab Sample ID	10427828001		
Filename	U180504B_12		
Injected By	BAL		
Total Amount Extracted	520 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/18/2018 15:15
ICAL ID	U180405	Received	04/18/2018 17:30
CCal Filename(s)	U180504A_16	Extracted	04/19/2018 15:10
Method Blank ID	BLANK-61838	Analyzed	05/05/2018 02:42

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	81
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	78

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61838	Matrix	Water
Filename	U180423B_07	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/19/2018 15:10
ICAL ID	U180405	Analyzed	04/23/2018 16:10
CCal Filename(s)	U180423B_01	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	61
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	64

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61839	Matrix	Water
Filename	U180423B_13	Dilution	NA
Total Amount Extracted	969 mL	Extracted	04/19/2018 15:10
ICAL ID	U180405	Analyzed	04/23/2018 20:58
CCal Filename	U180423B_01	Injected By	SMT
Method Blank ID	BLANK-61838		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	10	7.3	14.6	102
2,3,7,8-TCDD-37Cl4	10	6.4	3.7	15.8	64
2,3,7,8-TCDD-13C	100	63	25.0	141.0	63

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61840	Matrix	Water
Filename	U180423B_14	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	04/19/2018 15:10
ICAL ID	U180405	Analyzed	04/23/2018 21:46
CCal Filename	U180423B_01	Injected By	SMT
Method Blank ID	BLANK-61838		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	11	7.3	14.6	107
2,3,7,8-TCDD-37Cl4	10	8.1	3.7	15.8	81
2,3,7,8-TCDD-13C	100	80	25.0	141.0	80

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61839
Spike 1 Filename U180423B_13

Spike 2 ID LCSD-61840
Spike 2 Filename U180423B_14

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	102	107	4.8

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 17, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137
 Mississippi Certification #: MN00064
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon NwTPH Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DW Certification #: 9952 C
 West Virginia DEP Certification #: 382
 Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 California Certification #2973
 Alaska Certification UST-107
 Montana Certificate #CERT0103
 California Certification #2973
 Alaska Certification #MN01084
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445
 North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007
 Nevada DNR #MN010842018-1
 Oklahoma Department of Environmental Quality
 California Certification #2973

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad

Florida/TNI Certification #: E87683
 Georgia Certification #: C040
 Guam Certification
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Pennsylvania Certification IDs

KY WW Permit #: KY0098221	Ohio EPA Rad Approval: #41249
KY WW Permit #: KY0000221	Oregon/TNI Certification #: PA200002-010
Louisiana DHH/TNI Certification #: LA180012	Pennsylvania/TNI Certification #: 65-00282
Louisiana DEQ/TNI Certification #: 4086	Puerto Rico Certification #: PA01457
Maine Certification #: 2017020	Rhode Island Certification #: 65-00282
Maryland Certification #: 308	South Dakota Certification
Massachusetts Certification #: M-PA1457	Tennessee Certification #: 02867
Michigan/PADEP Certification #: 9991	Texas/TNI Certification #: T104704188-17-3
Missouri Certification #: 235	Utah/TNI Certification #: PA014572017-9
Montana Certification #: Cert0082	USDA Soil Permit #: P330-17-00091
Nebraska Certification #: NE-OS-29-14	Vermont Dept. of Health: ID# VT-0282
Nevada Certification #: PA014572018-1	Virgin Island/PADEP Certification
New Hampshire/TNI Certification #: 297617	Virginia/VELAP Certification #: 9526
New Jersey/TNI Certification #: PA051	Washington Certification #: C868
New Mexico Certification #: PA01457	West Virginia DEP Certification #: 143
New York/TNI Certification #: 10888	West Virginia DHHR Certification #: 9964C
North Carolina Certification #: 42706	Wisconsin Approve List for Rad
North Dakota Certification #: R-190	Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174	Nebraska Certification: NE-OS-28-14
Alabama Certification #: 41320	Nevada Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216	New Hampshire Certification #: 2958
Delaware Certification: FL NELAC Reciprocity	New Jersey Certification #: FL022
Florida Certification #: E83079	New York Certification #: 11608
Georgia Certification #: 955	North Carolina Environmental Certificate #: 667
Guam Certification: FL NELAC Reciprocity	North Carolina Certification #: 12710
Hawaii Certification: FL NELAC Reciprocity	Oklahoma Certification #: D9947
Illinois Certification #: 200068	Pennsylvania Certification #: 68-00547
Indiana Certification: FL NELAC Reciprocity	Puerto Rico Certification #: FL01264
Kansas Certification #: E-10383	South Carolina Certification: #96042001
Kentucky Certification #: 90050	Tennessee Certification #: TN02974
Louisiana Certification #: FL NELAC Reciprocity	Texas Certification: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007	US Virgin Islands Certification: FL NELAC Reciprocity
Maryland Certification: #346	Virginia Environmental Certification #: 460165
Michigan Certification #: 9911	Wyoming Certification: FL NELAC Reciprocity
Mississippi Certification: FL NELAC Reciprocity	West Virginia Certification #: 9962C
Missouri Certification #: 236	Wisconsin Certification #: 399079670
Montana Certification #: Cert 0074	Wyoming (EPA Region 8): FL NELAC Reciprocity

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512	New York State Department of Health, Serial #57971 and 57972
Minnesota Department of Health, Certificate #1385941	North Carolina Division of Water Resources, Certificate #659
Arkansas Department of Environmental Quality, Certificate #17-046-0	Virginia Department of General Services, Certificate #9028
Georgia Environmental Protection Division, Stipulation	Wisconsin Department of Natural Resources, Laboratory #999472650
Illinois Environmental Protection Agency, Certificate #004325	U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278
Michigan Department of Environmental Quality, Laboratory #0034	

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268

Illinois Certification #: 200074

Indiana Certification #: C-49-06

Kansas/NELAP Certification #:E-10177

Kentucky UST Certification #: 80226

Kentucky WW Certification #:98019

Ohio VAP Certification #: CL-0065

Oklahoma Certification #: 2017-124

Texas Certification #: T104704355-18-12

West Virginia Certification #: 330

Wisconsin Certification #: 999788130

USDA Soil Permit #: P330-16-00257

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10428032001	FL-TT-03	Water	04/19/18 09:30	04/20/18 08:30
10428032002	FL-TT-04	Water	04/19/18 13:00	04/20/18 08:30
10428032003	FL-TT-05	Water	04/19/18 15:45	04/20/18 08:30
10428032004	FL-TT-07	Water	04/19/18 18:03	04/20/18 08:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428032001	FL-TT-03	EPA 531.1	WFH	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NJV	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3, KEO	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMD	1	PASI-O
		SM 3500-Cr B Modified	JFP	1	PASI-M
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428032002	FL-TT-04	EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
		EPA 547	AC1	1	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3, KEO	2	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		
EPA 9016	AMM	1	PASI-GRMI		
SM 4500-CN-E	DCL	1	PASI-M		
SM 4500-P E	DCL	1	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428032003	FL-TT-05	EPA 531.1	WFH	3	PASI-O
		EPA 547	AC1	1	PASI-O
		EPA 549.2	AC1	2	PASI-O
		EPA 552.3	MMB	7	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3, KEO	2	PASI-M
		EPA 300.1	CMB	1	PASI-O
		EPA 300.1	CMD	1	PASI-O
SM 3500-Cr B Modified	JFP	1	PASI-M		
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10428032004	FL-TT-07	EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M
		EPA 547	AC1	1	PASI-O
		EPA 8011	XV1	3	PASI-M
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8015 Alcohol-Glycol	RID	1	PASI-I
		EPA 8081B	XV1	24	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 8315A	JLB	1	PASI-GRMI
		EPA 8316	JLB	1	PASI-GRMI
		EPA 200.7	DM	8	PASI-M
		EPA 200.8	RJS	2	PASI-M
		EPA 200.8	TT3	12	PASI-M
		EPA 245.1	LMW	1	PASI-M
		EPA 548.1	LAJ	1	PASI-O
		EPA 8270D	AT1	72	PASI-M
		EPA 524.2	AEZ	4	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		Hach 10360 Rev 1.1	AJS	1	PASI-M
		EPA 1664A OG	AR3	1	PASI-M
		EPA 180.1	JFP	1	PASI-M
		SM 2540D	NAS	1	PASI-M
		SM 4500-CIO2	AGS	1	PASI-O
		SM 4500-H+B	KEO	1	PASI-M
		Trivalent Chromium Calculation	KEO	1	PASI-M
		EPA 300.0	AR3, KEO	2	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
EPA 350.1	CLJ	1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
EPA 353.2	JFP	3	PASI-M		
EPA 9016	AMM	1	PASI-GRMI		
SM 4500-CN-E	DCL	1	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03	Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	5.6		0.10	1		04/19/18 09:30		
Field Temperature	9.5		0.50	1		04/19/18 09:30		
531.1 HPLC Carbamates								
Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/09/18 23:00	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/09/18 23:00	1563-66-2	
Surrogates								
BDMC (S)	94	%	80-120	1		05/09/18 23:00		
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		05/01/18 04:47		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 14:33	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 14:33	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:14	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	122	%	70-130	1	04/29/18 11:44	05/01/18 16:14	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 01:57	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 01:57	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	114	%.	30-150	1	04/24/18 14:16	04/25/18 01:57	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/25/18 14:45	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/27/18 15:39	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	309-00-2	L2
alpha-BHC	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	319-84-6	
beta-BHC	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	319-85-7	
delta-BHC	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	58-89-9	
Chlordane (Technical)	ND	ug/L	2.9	5	04/20/18 13:40	04/25/18 23:52	57-74-9	
alpha-Chlordane	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	5103-71-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03	Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
gamma-Chlordane	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	5103-74-2	
4,4'-DDD	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	72-54-8	
4,4'-DDE	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	72-55-9	
4,4'-DDT	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	50-29-3	
Dieldrin	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	60-57-1	
Endosulfan I	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	959-98-8	
Endosulfan II	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	1031-07-8	
Endrin	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	72-20-8	
Endrin aldehyde	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	7421-93-4	
Endrin ketone	ND	ug/L	0.57	5	04/20/18 13:40	04/25/18 23:52	53494-70-5	
Heptachlor	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	76-44-8	
Heptachlor epoxide	ND	ug/L	0.29	5	04/20/18 13:40	04/25/18 23:52	1024-57-3	
Methoxychlor	ND	ug/L	2.9	5	04/20/18 13:40	04/25/18 23:52	72-43-5	
Toxaphene	ND	ug/L	8.6	5	04/20/18 13:40	04/25/18 23:52	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	81	%.	62-125	5	04/20/18 13:40	04/25/18 23:52	877-09-8	2M, D3
Decachlorobiphenyl (S)	50	%.	30-143	5	04/20/18 13:40	04/25/18 23:52	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11141-16-5	
PCB-1242 (Aroclor 1242)	2.0	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	12672-29-6	
PCB-1254 (Aroclor 1254)	0.18	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	04/20/18 13:39	04/23/18 15:27	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	57	%.	30-125	1	04/20/18 13:39	04/23/18 15:27	877-09-8	
Decachlorobiphenyl (S)	57	%.	30-125	1	04/20/18 13:39	04/23/18 15:27	2051-24-3	CH
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/24/18 10:57	04/26/18 13:13	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 12:01	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/23/18 14:49	04/25/18 18:05	7429-90-5	
Barium, Dissolved	333	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:05	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:05	7440-50-8	
Manganese, Dissolved	1120	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:05	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:05	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:05	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03		Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:05	7440-31-5	
Zinc, Dissolved	28.3	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:05	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	4.4	ug/L	2.5	5	04/23/18 10:35	04/24/18 20:04	7440-47-3	
Total Hardness by 2340B	411000	ug/L	1410	10	04/23/18 10:35	04/25/18 15:33		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-36-0	
Arsenic, Dissolved	1.8	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 20:53	7440-41-7	
Boron, Dissolved	295	ug/L	5.0	1	04/23/18 14:28	04/24/18 20:53	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/24/18 20:53	7440-43-9	
Chromium, Dissolved	1.2	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-47-3	
Cobalt, Dissolved	1.7	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-48-4	
Lead, Dissolved	0.56	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:22	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 20:53	7440-28-0	
Uranium-238, Dissolved	0.69	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:53	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/23/18 14:28	04/24/18 20:53	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:09	7439-97-6	
548.1 GCS Endothall		Analytical Method: EPA 548.1 Preparation Method: EPA 548.1						
Endothall	ND	ug/L	9.0	1	04/25/18 08:26	04/27/18 09:29		IO
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Phenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	111-44-4	
2-Chlorophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	22.7	1	04/23/18 14:40	05/03/18 18:40		
N-Nitroso-di-n-propylamine	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	621-64-7	
Hexachloroethane	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	67-72-1	
Nitrobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	98-95-3	
Isophorone	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	78-59-1	
2-Nitrophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	88-75-5	
2,4-Dimethylphenol	ND	ug/L	56.8	1	04/23/18 14:40	05/03/18 18:40	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	111-91-1	
2,4-Dichlorophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	120-82-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03	Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Naphthalene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	91-20-3	
4-Chloroaniline	ND	ug/L	56.8	1	04/23/18 14:40	05/03/18 18:40	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	59-50-7	
2-Methylnaphthalene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	95-95-4	
2-Chloronaphthalene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	91-58-7	
2-Nitroaniline	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	88-74-4	
Dimethylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	131-11-3	
Acenaphthylene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	606-20-2	
3-Nitroaniline	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	99-09-2	
Acenaphthene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	83-32-9	
2,4-Dinitrophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	51-28-5	L2
4-Nitrophenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	100-02-7	
Dibenzofuran	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	121-14-2	
Diethylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	7005-72-3	
Fluorene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	86-73-7	
4-Nitroaniline	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	534-52-1	L2
N-Nitrosodiphenylamine	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	101-55-3	
Hexachlorobenzene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	118-74-1	
Pentachlorophenol	ND	ug/L	22.7	1	04/23/18 14:40	05/03/18 18:40	87-86-5	
Phenanthrene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	85-01-8	
Anthracene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	120-12-7	
Di-n-butylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	84-74-2	
Fluoranthene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	206-44-0	
Pyrene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	129-00-0	
Butylbenzylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	56.8	1	04/23/18 14:40	05/03/18 18:40	91-94-1	
Benzo(a)anthracene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	56-55-3	
Chrysene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	117-81-7	
Di-n-octylphthalate	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	117-84-0	
Benzo(b)fluoranthene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	207-08-9	
Benzo(a)pyrene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	122-66-7	
Carbazole	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	86-74-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03		Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
1-Methylnaphthalene	ND	ug/L	11.4	1	04/23/18 14:40	05/03/18 18:40	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	77	%.	60-125	1	04/23/18 14:40	05/03/18 18:40	4165-60-0	
2-Fluorobiphenyl (S)	73	%.	56-125	1	04/23/18 14:40	05/03/18 18:40	321-60-8	
p-Terphenyl-d14 (S)	75	%.	58-125	1	04/23/18 14:40	05/03/18 18:40	1718-51-0	
Phenol-d6 (S)	77	%.	58-125	1	04/23/18 14:40	05/03/18 18:40	13127-88-3	
2-Fluorophenol (S)	74	%.	55-125	1	04/23/18 14:40	05/03/18 18:40	367-12-4	
2,4,6-Tribromophenol (S)	80	%.	65-125	1	04/23/18 14:40	05/03/18 18:40	118-79-6	
524.2 MSV		Analytical Method: EPA 524.2						
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/24/18 15:06		
Surrogates								
4-Bromofluorobenzene (S)	98	%.	75-125	1		04/24/18 15:06	460-00-4	
Toluene-d8 (S)	95	%.	75-125	1		04/24/18 15:06	2037-26-5	
1,2-Dichloroethane-d4 (S)	97	%.	75-125	1		04/24/18 15:06	17060-07-0	
Field Data		Analytical Method:						
Field pH	5.6	Std. Units		1		04/19/18 09:30		
Field Temperature	9.5	deg C		1		04/19/18 09:30		
Hach 10360 Rev 1.1 BOD		Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360						
BOD, 5 day	11.2	mg/L	6.0	3	04/20/18 13:55	04/25/18 13:44		B4
1664 HEM, Oil and Grease		Analytical Method: EPA 1664A OG						
Oil and Grease	ND	mg/L	5.4	1		05/02/18 11:26		
180.1 Turbidity		Analytical Method: EPA 180.1						
Turbidity	156	NTU	6.0	20		04/20/18 11:53		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	130	mg/L	10.0	1		04/25/18 13:32		
4500ClO2 Chlorine Dioxide		Analytical Method: SM 4500-ClO2						
Chlorine Dioxide	0.83	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	6.8	Std. Units	0.10	1		04/27/18 11:26		H6
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	ND	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	11.9	mg/L	1.2	1		04/26/18 07:55	16887-00-6	
Fluoride	0.077	mg/L	0.050	1		05/03/18 18:18	16984-48-8	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-03		Lab ID: 10428032001		Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.1 Oxihalide IC Anions 14d		Analytical Method: EPA 300.1						
Chlorite	ND	ug/L	1000	200		04/27/18 13:26		D3
300.1 Oxihalide IC Anions 28d		Analytical Method: EPA 300.1						
Bromate	ND	ug/L	10.0	10		04/26/18 02:56	15541-45-4	D3
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/20/18 13:48		FS,H1
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:51		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	5.0	mg/L	0.10	1	04/26/18 14:30	04/27/18 13:40	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	0.022	mg/L	0.020	1		04/20/18 13:53	14797-55-8	FS
Nitrite as N	0.031	mg/L	0.020	1		04/20/18 13:53	14797-65-0	A
Nitrogen, NO2 plus NO3	0.054	mg/L	0.020	1		04/20/18 13:53		FS
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:08		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:18	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	ND	mg/L	0.10	1	05/01/18 10:14	05/02/18 08:07	7723-14-0	

Sample: FL-TT-04		Lab ID: 10428032002		Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	5.9		0.10	1		04/19/18 13:00		
Field Temperature	10.6		0.50	1		04/19/18 13:00		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		05/01/18 05:03		M1
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 02:23	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.0098	1	04/24/18 14:16	04/25/18 02:23	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	114	%	30-150	1	04/24/18 14:16	04/25/18 02:23	460-00-4	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/25/18 15:13	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/27/18 15:49	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	309-00-2	L2
alpha-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	319-84-6	
beta-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	319-85-7	
delta-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	58-89-9	
Chlordane (Technical)	ND	ug/L	2.6	5	04/20/18 13:40	04/26/18 00:11	57-74-9	
alpha-Chlordane	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	5103-71-9	
gamma-Chlordane	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	5103-74-2	
4,4'-DDD	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	72-54-8	
4,4'-DDE	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	72-55-9	
4,4'-DDT	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	50-29-3	
Dieldrin	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	60-57-1	
Endosulfan I	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	959-98-8	
Endosulfan II	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	1031-07-8	
Endrin	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	72-20-8	
Endrin aldehyde	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	7421-93-4	
Endrin ketone	ND	ug/L	0.51	5	04/20/18 13:40	04/26/18 00:11	53494-70-5	
Heptachlor	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	76-44-8	
Heptachlor epoxide	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:11	1024-57-3	
Methoxychlor	ND	ug/L	2.6	5	04/20/18 13:40	04/26/18 00:11	72-43-5	
Toxaphene	ND	ug/L	7.7	5	04/20/18 13:40	04/26/18 00:11	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	75	%	62-125	5	04/20/18 13:40	04/26/18 00:11	877-09-8	2M, D3
Decachlorobiphenyl (S)	43	%	30-143	5	04/20/18 13:40	04/26/18 00:11	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11141-16-5	
PCB-1242 (Aroclor 1242)	1.3	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	12672-29-6	
PCB-1254 (Aroclor 1254)	0.17	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:43	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	59	%	30-125	1	04/20/18 13:39	04/23/18 15:43	877-09-8	
Decachlorobiphenyl (S)	56	%	30-125	1	04/20/18 13:39	04/23/18 15:43	2051-24-3	CH

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/24/18 10:57	04/26/18 13:18	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 12:10	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/23/18 14:49	04/25/18 18:08	7429-90-5	
Barium, Dissolved	465	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:08	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:08	7440-50-8	
Manganese, Dissolved	1030	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:08	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:08	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:08	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:08	7440-31-5	
Zinc, Dissolved	155	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:08	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	19.5	ug/L	2.5	5	04/23/18 10:35	04/24/18 20:08	7440-47-3	
Total Hardness by 2340B	479000	ug/L	1410	10	04/23/18 10:35	04/25/18 15:37		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	1.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-36-0	
Arsenic, Dissolved	3.7	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 21:32	7440-41-7	
Boron, Dissolved	1090	ug/L	100	20	04/23/18 14:28	04/24/18 21:04	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/24/18 21:32	7440-43-9	
Chromium, Dissolved	0.96	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-47-3	
Cobalt, Dissolved	3.6	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-48-4	
Lead, Dissolved	10.9	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:25	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 21:32	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 21:32	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/23/18 14:28	04/24/18 21:32	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:16	7439-97-6	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Phenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	111-44-4	
2-Chlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.3	1	04/23/18 14:40	05/03/18 19:09		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
N-Nitroso-di-n-propylamine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	621-64-7	
Hexachloroethane	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	67-72-1	
Nitrobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	98-95-3	
Isophorone	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	78-59-1	
2-Nitrophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	88-75-5	
2,4-Dimethylphenol	ND	ug/L	50.8	1	04/23/18 14:40	05/03/18 19:09	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	120-82-1	
Naphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	91-20-3	
4-Chloroaniline	ND	ug/L	50.8	1	04/23/18 14:40	05/03/18 19:09	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	91-58-7	
2-Nitroaniline	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	88-74-4	
Dimethylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	131-11-3	
Acenaphthylene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	606-20-2	
3-Nitroaniline	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	99-09-2	
Acenaphthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	83-32-9	
2,4-Dinitrophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	51-28-5	L2
4-Nitrophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	100-02-7	
Dibenzofuran	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	121-14-2	
Diethylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	7005-72-3	
Fluorene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	86-73-7	
4-Nitroaniline	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	534-52-1	L2
N-Nitrosodiphenylamine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	101-55-3	
Hexachlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	118-74-1	
Pentachlorophenol	ND	ug/L	20.3	1	04/23/18 14:40	05/03/18 19:09	87-86-5	
Phenanthrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	85-01-8	
Anthracene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	120-12-7	
Di-n-butylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	84-74-2	
Fluoranthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	206-44-0	
Pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	129-00-0	
Butylbenzylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	50.8	1	04/23/18 14:40	05/03/18 19:09	91-94-1	
Benzo(a)anthracene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	56-55-3	
Chrysene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	117-81-7	
Di-n-octylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	117-84-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Benzo(b)fluoranthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	207-08-9	
Benzo(a)pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	122-66-7	
Carbazole	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	86-74-8	
1-Methylnaphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 19:09	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	69	%.	60-125	1	04/23/18 14:40	05/03/18 19:09	4165-60-0	
2-Fluorobiphenyl (S)	65	%.	56-125	1	04/23/18 14:40	05/03/18 19:09	321-60-8	
p-Terphenyl-d14 (S)	76	%.	58-125	1	04/23/18 14:40	05/03/18 19:09	1718-51-0	
Phenol-d6 (S)	71	%.	58-125	1	04/23/18 14:40	05/03/18 19:09	13127-88-3	
2-Fluorophenol (S)	66	%.	55-125	1	04/23/18 14:40	05/03/18 19:09	367-12-4	
2,4,6-Tribromophenol (S)	85	%.	65-125	1	04/23/18 14:40	05/03/18 19:09	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/24/18 15:30		
Surrogates								
4-Bromofluorobenzene (S)	99	%.	75-125	1		04/24/18 15:30	460-00-4	
Toluene-d8 (S)	95	%.	75-125	1		04/24/18 15:30	2037-26-5	
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1		04/24/18 15:30	17060-07-0	
Field Data								
Analytical Method:								
Field pH	5.9	Std. Units		1		04/19/18 13:00		
Field Temperature	10.6	deg C		1		04/19/18 13:00		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	ND	mg/L	20.0	10	04/20/18 13:55	04/25/18 13:48		B4
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	4.8	1		05/02/18 11:26		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	246	NTU	6.0	20		04/20/18 11:55		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	249	mg/L	10.0	1		04/25/18 13:32		
4500ClO2 Chlorine Dioxide								
Analytical Method: SM 4500-ClO2								
Chlorine Dioxide	0.88	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.7	Std. Units	0.10	1		04/27/18 11:26		H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-04	Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Trivalent Chromium Calculation Analytical Method: Trivalent Chromium Calculation								
Chromium, Trivalent	0.020	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions Analytical Method: EPA 300.0								
Chloride	109	mg/L	2.4	2		04/26/18 13:06	16887-00-6	
Fluoride	0.17	mg/L	0.050	1		05/03/18 18:33	16984-48-8	
Chromium, Hexavalent Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		04/20/18 13:48		FS,H1
350.1 Ammonia, Unionized Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:52		
350.1 Ammonia, Distilled Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	7.8	mg/L	0.10	1	04/26/18 14:30	04/27/18 13:36	7664-41-7	
353.2 Nitrate + Nitrite Analytical Method: EPA 353.2								
Nitrate as N	0.080	mg/L	0.020	1		04/20/18 13:54	14797-55-8	FS
Nitrite as N	0.027	mg/L	0.020	1		04/20/18 13:54	14797-65-0	FS,M1
Nitrogen, NO2 plus NO3	0.11	mg/L	0.020	1		04/20/18 13:54		FS,M1
9016 Cyanide, Free Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:08		
SM4500CN-E Cyanide Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:19	57-12-5	
SM4500P-E, Total Phosphorus Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B								
Phosphorus	0.12	mg/L	0.10	1	05/01/18 10:14	05/02/18 08:08	7723-14-0	

Sample: FL-TT-05	Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:								
Field pH	6.3		0.10	1		04/19/18 15:45		
Field Temperature	8.5		0.50	1		04/19/18 15:45		
531.1 HPLC Carbamates Analytical Method: EPA 531.1								
Aldicarb	ND	ug/L	2.0	1		05/09/18 23:48	116-06-3	
Carbofuran	ND	ug/L	2.0	1		05/09/18 23:48	1563-66-2	
Surrogates								
BDMC (S)	86	%	80-120	1		05/09/18 23:48		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05	Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
547 HPLC Glyphosate								
Analytical Method: EPA 547								
Glyphosate	ND	ug/L	6.0	1		05/01/18 05:18		
549.2 HPLC Paraquat Diquat								
Analytical Method: EPA 549.2 Preparation Method: EPA 549.2								
Diquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 14:39	85-00-7	
Paraquat	ND	ug/L	0.40	1	04/24/18 23:10	04/25/18 14:39	1910-42-5	
552.3 Haloacetic Acids								
Analytical Method: EPA 552.3 Preparation Method: EPA 552.3								
Dibromoacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	631-64-1	
Dichloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	79-43-6	
Haloacetic Acids (Total)	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56		
Monobromoacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	79-08-3	
Monochloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	79-11-8	
Trichloroacetic Acid	ND	ug/L	1.0	1	04/29/18 11:44	05/01/18 16:56	76-03-9	
Surrogates								
2,3-Dibromopropanoic Acid (S)	117	%	70-130	1	04/29/18 11:44	05/01/18 16:56	600-05-5	
8011 GCS EDB and DBCP								
Analytical Method: EPA 8011 Preparation Method: EPA 8011								
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 02:49	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 02:49	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	114	%	30-150	1	04/24/18 14:16	04/25/18 02:49	460-00-4	
8015M Alcohols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Methanol	ND	mg/L	5.0	1		04/25/18 15:22	67-56-1	
8015M Glycols in water								
Analytical Method: EPA 8015 Alcohol-Glycol								
Ethylene glycol	ND	mg/L	5.0	1		04/27/18 15:58	107-21-1	
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Aldrin	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	309-00-2	L2
alpha-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	319-84-6	
beta-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	319-85-7	
delta-BHC	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	58-89-9	
Chlordane (Technical)	ND	ug/L	2.6	5	04/20/18 13:40	04/26/18 00:29	57-74-9	
alpha-Chlordane	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	5103-71-9	
gamma-Chlordane	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	5103-74-2	
4,4'-DDD	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	72-54-8	
4,4'-DDE	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	72-55-9	
4,4'-DDT	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	50-29-3	
Dieldrin	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	60-57-1	
Endosulfan I	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	959-98-8	
Endosulfan II	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	1031-07-8	
Endrin	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	72-20-8	
Endrin aldehyde	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	7421-93-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05	Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
Endrin ketone	ND	ug/L	0.52	5	04/20/18 13:40	04/26/18 00:29	53494-70-5	
Heptachlor	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	76-44-8	
Heptachlor epoxide	ND	ug/L	0.26	5	04/20/18 13:40	04/26/18 00:29	1024-57-3	
Methoxychlor	ND	ug/L	2.6	5	04/20/18 13:40	04/26/18 00:29	72-43-5	
Toxaphene	ND	ug/L	7.7	5	04/20/18 13:40	04/26/18 00:29	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	81	%.	62-125	5	04/20/18 13:40	04/26/18 00:29	877-09-8	2M, D3
Decachlorobiphenyl (S)	55	%.	30-143	5	04/20/18 13:40	04/26/18 00:29	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11141-16-5	
PCB-1242 (Aroclor 1242)	3.8	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	12672-29-6	
PCB-1254 (Aroclor 1254)	0.19	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 15:58	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	60	%.	30-125	1	04/20/18 13:39	04/23/18 15:58	877-09-8	
Decachlorobiphenyl (S)	71	%.	30-125	1	04/20/18 13:39	04/23/18 15:58	2051-24-3	CH
8315A GCSV Aldehydes								
Analytical Method: EPA 8315A Preparation Method: EPA 8315A								
Formaldehyde	ND	ug/L	100	1	04/24/18 10:57	04/26/18 13:23	50-00-0	H3
8316 W GCSV Acrylamide								
Analytical Method: EPA 8316								
Acrylamide	ND	ug/L	20.0	1		04/24/18 12:20	79-06-1	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/23/18 14:49	04/25/18 18:11	7429-90-5	
Barium, Dissolved	250	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:11	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:11	7440-50-8	
Manganese, Dissolved	749	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:11	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:11	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:11	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:11	7440-31-5	
Zinc, Dissolved	97.3	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:11	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	11.6	ug/L	2.5	5	04/23/18 10:35	04/25/18 15:52	7440-47-3	
Total Hardness by 2340B	303000	ug/L	705	5	04/23/18 10:35	04/25/18 15:52		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	0.58	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-36-0	
Arsenic, Dissolved	3.4	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-38-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05		Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 20:58	7440-41-7	
Boron, Dissolved	406	ug/L	5.0	1	04/23/18 14:28	04/24/18 20:58	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/24/18 20:58	7440-43-9	
Chromium, Dissolved	0.69	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-47-3	
Cobalt, Dissolved	4.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-48-4	
Lead, Dissolved	1.6	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:28	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 20:58	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 20:58	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/23/18 14:28	04/24/18 20:58	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:19	7439-97-6	
548.1 GCS Endothall		Analytical Method: EPA 548.1 Preparation Method: EPA 548.1						
Endothall	ND	ug/L	9.0	1	04/25/18 08:26	04/27/18 09:41		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Phenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	111-44-4	
2-Chlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.6	1	04/23/18 14:40	05/03/18 19:37		
N-Nitroso-di-n-propylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	621-64-7	
Hexachloroethane	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	67-72-1	
Nitrobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	98-95-3	
Isophorone	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	78-59-1	
2-Nitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	88-75-5	
2,4-Dimethylphenol	ND	ug/L	51.5	1	04/23/18 14:40	05/03/18 19:37	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	120-82-1	
Naphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	91-20-3	
4-Chloroaniline	ND	ug/L	51.5	1	04/23/18 14:40	05/03/18 19:37	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	91-58-7	
2-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	88-74-4	
Dimethylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	131-11-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05		Lab ID: 10428032003		Collected: 04/19/18 15:45		Received: 04/20/18 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520							
Acenaphthylene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	208-96-8		
2,6-Dinitrotoluene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	606-20-2		
3-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	99-09-2		
Acenaphthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	83-32-9		
2,4-Dinitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	51-28-5	L2	
4-Nitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	100-02-7		
Dibenzofuran	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	132-64-9		
2,4-Dinitrotoluene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	121-14-2		
Diethylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	84-66-2		
4-Chlorophenylphenyl ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	7005-72-3		
Fluorene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	86-73-7		
4-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	100-01-6		
4,6-Dinitro-2-methylphenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	534-52-1	L2	
N-Nitrosodiphenylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	86-30-6		
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	101-55-3		
Hexachlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	118-74-1		
Pentachlorophenol	ND	ug/L	20.6	1	04/23/18 14:40	05/03/18 19:37	87-86-5		
Phenanthrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	85-01-8		
Anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	120-12-7		
Di-n-butylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	84-74-2		
Fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	206-44-0		
Pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	129-00-0		
Butylbenzylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	85-68-7		
3,3'-Dichlorobenzidine	ND	ug/L	51.5	1	04/23/18 14:40	05/03/18 19:37	91-94-1		
Benzo(a)anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	56-55-3		
Chrysene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	218-01-9		
bis(2-Ethylhexyl)phthalate	264	ug/L	20.6	2	04/23/18 14:40	05/04/18 14:46	117-81-7		
Di-n-octylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	117-84-0		
Benzo(b)fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	205-99-2		
Benzo(k)fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	207-08-9		
Benzo(a)pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	50-32-8		
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	193-39-5		
Dibenz(a,h)anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	53-70-3		
Benzo(g,h,i)perylene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	191-24-2		
N-Nitrosodimethylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	62-75-9		
1,2-Diphenylhydrazine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	122-66-7		
Carbazole	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	86-74-8		
1-Methylnaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 19:37	90-12-0		
Surrogates									
Nitrobenzene-d5 (S)	76	%	60-125	1	04/23/18 14:40	05/03/18 19:37	4165-60-0		
2-Fluorobiphenyl (S)	73	%	56-125	1	04/23/18 14:40	05/03/18 19:37	321-60-8		
p-Terphenyl-d14 (S)	81	%	58-125	1	04/23/18 14:40	05/03/18 19:37	1718-51-0		
Phenol-d6 (S)	81	%	58-125	1	04/23/18 14:40	05/03/18 19:37	13127-88-3		
2-Fluorophenol (S)	77	%	55-125	1	04/23/18 14:40	05/03/18 19:37	367-12-4		
2,4,6-Tribromophenol (S)	91	%	65-125	1	04/23/18 14:40	05/03/18 19:37	118-79-6		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05	Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
524.2 MSV	Analytical Method: EPA 524.2							
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/24/18 15:53		
Surrogates								
4-Bromofluorobenzene (S)	99	%.	75-125	1		04/24/18 15:53	460-00-4	
Toluene-d8 (S)	95	%.	75-125	1		04/24/18 15:53	2037-26-5	
1,2-Dichloroethane-d4 (S)	97	%.	75-125	1		04/24/18 15:53	17060-07-0	
Field Data	Analytical Method:							
Field pH	6.3	Std. Units		1		04/19/18 15:45		
Field Temperature	8.5	deg C		1		04/19/18 15:45		
Hach 10360 Rev 1.1 BOD	Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360							
BOD, 5 day	15.9	mg/L	6.0	3	04/20/18 13:55	04/25/18 13:55		B4
1664 HEM, Oil and Grease	Analytical Method: EPA 1664A OG							
Oil and Grease	ND	mg/L	4.9	1		05/02/18 11:26		
180.1 Turbidity	Analytical Method: EPA 180.1							
Turbidity	196	NTU	6.0	20		04/20/18 11:59		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	184	mg/L	10.0	1		04/25/18 13:32		
4500ClO2 Chlorine Dioxide	Analytical Method: SM 4500-ClO2							
Chlorine Dioxide	1.5	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.8	Std. Units	0.10	1		04/27/18 11:27		H6
Trivalent Chromium Calculation	Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	0.012	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	37.1	mg/L	1.2	1		04/26/18 08:25	16887-00-6	
Fluoride	0.13	mg/L	0.050	1		05/03/18 18:48	16984-48-8	
300.1 Oxihalide IC Anions 14d	Analytical Method: EPA 300.1							
Chlorite	ND	ug/L	1000	200		04/27/18 15:37		D3
300.1 Oxihalide IC Anions 28d	Analytical Method: EPA 300.1							
Bromate	ND	ug/L	10.0	10		04/26/18 05:07	15541-45-4	D3
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/20/18 13:48		FS

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-05		Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:53		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	4.5	mg/L	0.10	1	04/26/18 14:30	04/27/18 13:38	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	0.076	mg/L	0.020	1		04/20/18 13:58	14797-55-8	FS
Nitrite as N	ND	mg/L	0.020	1		04/20/18 13:58	14797-65-0	FS
Nitrogen, NO ₂ plus NO ₃	0.094	mg/L	0.020	1		04/20/18 13:58		FS
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:09		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:23	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	ND	mg/L	0.10	1	05/01/18 10:14	05/02/18 08:08	7723-14-0	

Sample: FL-TT-07		Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	6.2		0.10	1		04/19/18 18:03		
Field Temperature	6.0		0.50	1		04/19/18 18:03		
547 HPLC Glyphosate		Analytical Method: EPA 547						
Glyphosate	ND	ug/L	6.0	1		05/01/18 05:34		
8011 GCS EDB and DBCP		Analytical Method: EPA 8011 Preparation Method: EPA 8011						
1,2-Dibromo-3-chloropropane	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 03:15	96-12-8	
1,2-Dibromoethane (EDB)	ND	ug/L	0.010	1	04/24/18 14:16	04/25/18 03:15	106-93-4	
Surrogates								
4-Bromofluorobenzene (S)	117	%	30-150	1	04/24/18 14:16	04/25/18 03:15	460-00-4	
8015M Alcohols in water		Analytical Method: EPA 8015 Alcohol-Glycol						
Methanol	ND	mg/L	5.0	1		04/25/18 15:31	67-56-1	
8015M Glycols in water		Analytical Method: EPA 8015 Alcohol-Glycol						
Ethylene glycol	ND	mg/L	5.0	1		04/27/18 16:07	107-21-1	
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	309-00-2	L2

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
alpha-BHC	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	319-84-6	
beta-BHC	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	319-85-7	
delta-BHC	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	58-89-9	
Chlordane (Technical)	ND	ug/L	0.53	1	04/20/18 13:40	04/25/18 20:49	57-74-9	
alpha-Chlordane	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	5103-71-9	
gamma-Chlordane	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	5103-74-2	
4,4'-DDD	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	72-54-8	
4,4'-DDE	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	72-55-9	
4,4'-DDT	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	50-29-3	
Dieldrin	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	60-57-1	
Endosulfan I	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	959-98-8	
Endosulfan II	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	1031-07-8	
Endrin	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	72-20-8	
Endrin aldehyde	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	7421-93-4	
Endrin ketone	ND	ug/L	0.11	1	04/20/18 13:40	04/25/18 20:49	53494-70-5	
Heptachlor	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	76-44-8	
Heptachlor epoxide	ND	ug/L	0.053	1	04/20/18 13:40	04/25/18 20:49	1024-57-3	
Methoxychlor	ND	ug/L	0.53	1	04/20/18 13:40	04/25/18 20:49	72-43-5	
Toxaphene	ND	ug/L	1.6	1	04/20/18 13:40	04/25/18 20:49	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	83	%	62-125	1	04/20/18 13:40	04/25/18 20:49	877-09-8	
Decachlorobiphenyl (S)	28	%	30-143	1	04/20/18 13:40	04/25/18 20:49	2051-24-3	3M, S0
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/20/18 13:39	04/23/18 16:14	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	55	%	30-125	1	04/20/18 13:39	04/23/18 16:14	877-09-8	
Decachlorobiphenyl (S)	63	%	30-125	1	04/20/18 13:39	04/23/18 16:14	2051-24-3	CH
8315A GCSV Aldehydes		Analytical Method: EPA 8315A Preparation Method: EPA 8315A						
Formaldehyde	ND	ug/L	100	1	04/24/18 10:57	04/26/18 13:28	50-00-0	H3
8316 W GCSV Acrylamide		Analytical Method: EPA 8316						
Acrylamide	ND	ug/L	20.0	1		04/24/18 12:30	79-06-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	358	ug/L	200	1	04/23/18 14:49	04/25/18 18:13	7429-90-5	
Barium, Dissolved	607	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:13	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:13	7440-50-8	
Manganese, Dissolved	902	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:13	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:13	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:13	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:13	7440-31-5	
Zinc, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:13	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	1.6	ug/L	0.50	1	04/23/18 10:35	04/25/18 15:56	7440-47-3	
Total Hardness by 2340B	632000	ug/L	2820	20	04/23/18 10:35	04/25/18 16:01		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-36-0	
Arsenic, Dissolved	1.4	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 01:39	7440-41-7	
Boron, Dissolved	1610	ug/L	100	20	04/23/18 14:28	04/24/18 21:12	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/23/18 14:28	04/24/18 01:39	7440-43-9	
Chromium, Dissolved	0.90	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-47-3	
Cobalt, Dissolved	1.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-48-4	
Lead, Dissolved	0.54	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:39	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:39	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:39	7440-61-1	
Vanadium, Dissolved	1.2	ug/L	1.0	1	04/23/18 14:28	04/24/18 01:39	7440-62-2	
245.1 Mercury, Dissolved								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:21	7439-97-6	
548.1 GCS Endothall								
Analytical Method: EPA 548.1 Preparation Method: EPA 548.1								
Endothall	ND	ug/L	9.0	1	04/25/18 08:26	04/26/18 19:00		
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Phenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	108-95-2	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	111-44-4	
2-Chlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	95-57-8	
1,3-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	106-46-7	
1,2-Dichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	95-50-1	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	95-48-7	
bis(2-Chloroisopropyl) ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	108-60-1	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.5	1	04/23/18 14:40	05/03/18 20:06		
N-Nitroso-di-n-propylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	621-64-7	
Hexachloroethane	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	67-72-1	
Nitrobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	98-95-3	

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Isophorone	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	78-59-1	
2-Nitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	88-75-5	
2,4-Dimethylphenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:06	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	111-91-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	120-82-1	
Naphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	91-20-3	
4-Chloroaniline	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:06	106-47-8	
Hexachloro-1,3-butadiene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	87-68-3	
4-Chloro-3-methylphenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	59-50-7	
2-Methylnaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	91-57-6	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	88-06-2	
2,4,5-Trichlorophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	95-95-4	
2-Chloronaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	91-58-7	
2-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	88-74-4	
Dimethylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	131-11-3	
Acenaphthylene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	208-96-8	
2,6-Dinitrotoluene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	606-20-2	
3-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	99-09-2	
Acenaphthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	83-32-9	
2,4-Dinitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	51-28-5	L2
4-Nitrophenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	100-02-7	
Dibenzofuran	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	132-64-9	
2,4-Dinitrotoluene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	121-14-2	
Diethylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	84-66-2	
4-Chlorophenylphenyl ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	7005-72-3	
Fluorene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	86-73-7	
4-Nitroaniline	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	100-01-6	
4,6-Dinitro-2-methylphenol	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	534-52-1	L2
N-Nitrosodiphenylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	86-30-6	
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	101-55-3	
Hexachlorobenzene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	118-74-1	
Pentachlorophenol	ND	ug/L	20.5	1	04/23/18 14:40	05/03/18 20:06	87-86-5	
Phenanthrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	85-01-8	
Anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	120-12-7	
Di-n-butylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	84-74-2	
Fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	206-44-0	
Pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	129-00-0	
Butylbenzylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:06	91-94-1	
Benzo(a)anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	56-55-3	
Chrysene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	117-81-7	
Di-n-octylphthalate	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	117-84-0	
Benzo(b)fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	205-99-2	
Benzo(k)fluoranthene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	207-08-9	
Benzo(a)pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	50-32-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	193-39-5	
Dibenz(a,h)anthracene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	53-70-3	
Benzo(g,h,i)perylene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	191-24-2	
N-Nitrosodimethylamine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	62-75-9	
1,2-Diphenylhydrazine	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	122-66-7	
Carbazole	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	86-74-8	
1-Methylnaphthalene	ND	ug/L	10.3	1	04/23/18 14:40	05/03/18 20:06	90-12-0	
Surrogates								
Nitrobenzene-d5 (S)	67	%	60-125	1	04/23/18 14:40	05/03/18 20:06	4165-60-0	
2-Fluorobiphenyl (S)	62	%	56-125	1	04/23/18 14:40	05/03/18 20:06	321-60-8	
p-Terphenyl-d14 (S)	77	%	58-125	1	04/23/18 14:40	05/03/18 20:06	1718-51-0	
Phenol-d6 (S)	69	%	58-125	1	04/23/18 14:40	05/03/18 20:06	13127-88-3	
2-Fluorophenol (S)	65	%	55-125	1	04/23/18 14:40	05/03/18 20:06	367-12-4	
2,4,6-Tribromophenol (S)	80	%	65-125	1	04/23/18 14:40	05/03/18 20:06	118-79-6	
524.2 MSV								
Analytical Method: EPA 524.2								
Total Trihalomethanes (Calc.)	ND	ug/L	4.0	1		04/24/18 16:17		
Surrogates								
4-Bromofluorobenzene (S)	100	%	75-125	1		04/24/18 16:17	460-00-4	
Toluene-d8 (S)	92	%	75-125	1		04/24/18 16:17	2037-26-5	
1,2-Dichloroethane-d4 (S)	98	%	75-125	1		04/24/18 16:17	17060-07-0	
Field Data								
Analytical Method:								
Field pH	6.2	Std. Units		1		04/19/18 18:03		
Field Temperature	6.0	deg C		1		04/19/18 18:03		
Hach 10360 Rev 1.1 BOD								
Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360								
BOD, 5 day	ND	mg/L	20.0	10	04/20/18 13:55	04/25/18 13:57		B4
1664 HEM, Oil and Grease								
Analytical Method: EPA 1664A OG								
Oil and Grease	ND	mg/L	5.0	1		05/02/18 11:26		
180.1 Turbidity								
Analytical Method: EPA 180.1								
Turbidity	152	NTU	3.0	10		04/20/18 12:00		
2540D Total Suspended Solids								
Analytical Method: SM 2540D								
Total Suspended Solids	95.0	mg/L	10.0	1		04/25/18 13:32		
4500ClO2 Chlorine Dioxide								
Analytical Method: SM 4500-ClO2								
Chlorine Dioxide	ND	mg/L	0.10	1		04/25/18 13:31		H6
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	6.7	Std. Units	0.10	1		04/27/18 11:28		H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07	Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Trivalent Chromium Calculation	Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	ND	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions	Analytical Method: EPA 300.0							
Chloride	47.6	mg/L	1.2	1		04/26/18 08:40	16887-00-6	
Fluoride	0.085	mg/L	0.050	1		05/03/18 19:03	16984-48-8	
Chromium, Hexavalent	Analytical Method: SM 3500-Cr B Modified							
Chromium, Hexavalent	ND	mg/L	0.010	1		04/20/18 13:48		FS,M1
350.1 Ammonia, Unionized	Analytical Method: EPA 350.1							
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 09:54		
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)							
Nitrogen, Ammonia	9.7	mg/L	0.10	1	04/26/18 14:30	04/27/18 13:39	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
Nitrate as N	0.34	mg/L	0.020	1		04/20/18 13:59	14797-55-8	FS
Nitrite as N	0.056	mg/L	0.020	1		04/20/18 13:59	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.40	mg/L	0.020	1		04/20/18 13:59		FS
9016 Cyanide, Free	Analytical Method: EPA 9016 Preparation Method: EPA 9016							
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:10		
SM4500CN-E Cyanide	Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E							
Cyanide	ND	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:23	57-12-5	
SM4500P-E, Total Phosphorus	Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B							
Phosphorus	ND	mg/L	0.10	1	05/01/18 10:14	05/02/18 08:09	7723-14-0	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 445530 Analysis Method: EPA 531.1
QC Batch Method: EPA 531.1 Analysis Description: 531.1 HPLC Carbamate
Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2416175 Matrix: Water

Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aldicarb	ug/L	ND	2.0	05/09/18 11:12	
Carbofuran	ug/L	ND	2.0	05/09/18 11:12	
BDMC (S)	%	98	80-120	05/09/18 11:12	

LABORATORY CONTROL SAMPLE: 2416176

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aldicarb	ug/L	10	10.3	103	80-120	
Carbofuran	ug/L	10	9.3	93	80-120	
BDMC (S)	%			121	80-120 S0	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2416177 2416178

Parameter	Units	92381611002 Result	MS		MSD		MS		MSD		% Rec Limits	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	RPD	RPD				
Aldicarb	ug/L	ND	10	10	7.6	10.7	76	107	80-120	33	20	M1,R1		
Carbofuran	ug/L	ND	10	10	7.5	11.5	75	115	80-120	42	20	M1,R1		
BDMC (S)	%						64	139	80-120			S0		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 443841 Analysis Method: EPA 547
QC Batch Method: EPA 547 Analysis Description: 547 HPLC Glyphosate
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2407686 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Glyphosate	ug/L	ND	6.0	05/01/18 00:53	

LABORATORY CONTROL SAMPLE: 2407687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Glyphosate	ug/L	50	53.0	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2407688 2407689

Parameter	Units	35388339006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	4.2U	50	50	49.8	52.1	100	104	80-120	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2407690 2407691

Parameter	Units	10428032002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Glyphosate	ug/L	ND	50	50	ND	ND	0	0	80-120		30	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 438905 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2027992 Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methanol	mg/L	ND	5.0	04/25/18 14:17	

LABORATORY CONTROL SAMPLE: 2027993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methanol	mg/L	50	46.8	94	79-111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027994 2027995

Parameter	Units	2027994		2027995		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10428032001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result					
Methanol	mg/L	ND	50	50	47.1	51.9	91	101	43-138	10 20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 438816 Analysis Method: EPA 8015 Alcohol-Glycol

QC Batch Method: EPA 8015 Alcohol-Glycol Analysis Description: EPA 8015 Modified

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2027761

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylene glycol	mg/L	ND	5.0	04/26/18 14:21	

LABORATORY CONTROL SAMPLE: 2027762

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylene glycol	mg/L	25	19.5	78	55-144	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2030951 2030952

Parameter	Units	50195437002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Ethylene glycol	mg/L	ND	25	25	30.7	29.5	113	108	38-154	4	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 21113 Analysis Method: EPA 8316
QC Batch Method: EPA 8316 Analysis Description: 8316 W GCSV Acrylamide
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 84170 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acrylamide	ug/L	ND	20.0	04/24/18 11:22	

LABORATORY CONTROL SAMPLE: 84171

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acrylamide	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84172 84173

Parameter	Units	10428032004		84173		% Rec	% Rec	% Rec	% Rec	Limits	Max RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Acrylamide	ug/L	ND	1000	1000	921	1040	92	104	78-135	12	16		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 533435 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2897770 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/25/18 17:32	
Barium, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Copper, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Manganese, Dissolved	ug/L	ND	5.0	04/25/18 17:32	
Nickel, Dissolved	ug/L	ND	20.0	04/25/18 17:32	
Silver, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Tin, Dissolved	ug/L	ND	75.0	04/25/18 17:32	
Zinc, Dissolved	ug/L	ND	20.0	04/25/18 17:32	

LABORATORY CONTROL SAMPLE: 2897771

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	103	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	986	99	85-115	
Manganese, Dissolved	ug/L	1000	1050	105	85-115	
Nickel, Dissolved	ug/L	1000	1060	106	85-115	
Silver, Dissolved	ug/L	500	503	101	85-115	
Tin, Dissolved	ug/L	1000	1040	104	85-115	
Zinc, Dissolved	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897772 2897773

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427742001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21200	21400	106	107	70-130	1	30
Barium, Dissolved	ug/L	95.0	1000	1000	1130	1140	104	104	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	70-130	1	30
Manganese, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	70-130	1	30
Silver, Dissolved	ug/L	ND	500	500	509	514	102	103	70-130	1	30
Tin, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Zinc, Dissolved	ug/L	36.2	1000	1000	1070	1070	103	104	70-130	1	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

MATRIX SPIKE SAMPLE: 2898920		10428032004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	358	20000	22100	109	70-130	
Barium, Dissolved	ug/L	607	1000	1630	102	70-130	
Copper, Dissolved	ug/L	ND	1000	1020	102	70-130	
Manganese, Dissolved	ug/L	902	1000	1940	103	70-130	
Nickel, Dissolved	ug/L	ND	1000	1030	102	70-130	
Silver, Dissolved	ug/L	ND	500	515	103	70-130	
Tin, Dissolved	ug/L	ND	1000	1040	104	70-130	
Zinc, Dissolved	ug/L	ND	1000	1030	102	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 533691 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898992 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/24/18 18:12	

LABORATORY CONTROL SAMPLE: 2898993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	99.9	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898994 2898995

Parameter	Units	10428058001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Chromium	ug/L	0.77	100	100	101	104	100	103	70-130	2	20				

MATRIX SPIKE SAMPLE: 2898996

Parameter	Units	10428098002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	<0.50	100	99.4	99	70-130	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 533428 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2897737 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Arsenic, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Beryllium, Dissolved	ug/L	ND	0.20	04/25/18 08:49	
Boron, Dissolved	ug/L	ND	5.0	04/25/18 08:49	
Cadmium, Dissolved	ug/L	ND	0.080	04/25/18 08:49	
Chromium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Cobalt, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Lead, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Selenium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Thallium, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Uranium-238, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Vanadium, Dissolved	ug/L	ND	1.0	04/25/18 08:49	

LABORATORY CONTROL SAMPLE: 2897738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.4	99	85-115	
Arsenic, Dissolved	ug/L	100	99.4	99	85-115	
Beryllium, Dissolved	ug/L	100	107	107	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	99.0	99	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	102	102	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	101	101	85-115	
Vanadium, Dissolved	ug/L	100	99.6	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739 2897740

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427867001 Result	Spike Conc.	Spike Conc.	MS Result						
Antimony, Dissolved	ug/L	0.0029 mg/L	100	100	110	108	107	105	70-130	2	20
Arsenic, Dissolved	ug/L	ND	100	100	112	109	111	109	70-130	2	20
Beryllium, Dissolved	ug/L	ND	100	100	107	104	107	104	70-130	3	20
Boron, Dissolved	ug/L	32.5	100	100	137	133	104	101	70-130	2	20

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739												2897740	
Parameter	Units	10427867001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Cadmium, Dissolved	ug/L	ND	100	100	102	101	102	101	70-130	2	20		
Chromium, Dissolved	ug/L	ND	100	100	109	107	109	107	70-130	2	20		
Cobalt, Dissolved	ug/L	3.7	100	100	108	106	104	103	70-130	1	20		
Lead, Dissolved	ug/L	ND	100	100	105	103	105	103	70-130	3	20		
Selenium, Dissolved	ug/L	0.00058 mg/L	100	100	114	111	113	110	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	104	100	104	100	70-130	4	20		
Uranium-238, Dissolved	ug/L	10.3	100	100	118	116	108	106	70-130	2	20		
Vanadium, Dissolved	ug/L	ND	100	100	110	108	110	108	70-130	2	20		

MATRIX SPIKE SAMPLE: 2897741									
Parameter	Units	10427767003	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	105	105	70-130			
Arsenic, Dissolved	ug/L	ND	100	106	106	70-130			
Beryllium, Dissolved	ug/L	ND	100	115	115	70-130			
Boron, Dissolved	ug/L	11.5	100	124	113	70-130			
Cadmium, Dissolved	ug/L	ND	100	104	104	70-130			
Chromium, Dissolved	ug/L	ND	100	109	109	70-130			
Cobalt, Dissolved	ug/L	ND	100	110	110	70-130			
Lead, Dissolved	ug/L	ND	100	110	110	70-130			
Selenium, Dissolved	ug/L	ND	100	109	109	70-130			
Thallium, Dissolved	ug/L	ND	100	109	109	70-130			
Uranium-238, Dissolved	ug/L	ND	100	108	108	70-130			
Vanadium, Dissolved	ug/L	ND	100	107	107	70-130			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 534005 Analysis Method: EPA 524.2

QC Batch Method: EPA 524.2 Analysis Description: 524.2 MSV

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2901053 Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	ND	4.0	04/24/18 12:20	
1,2-Dichloroethane-d4 (S)	%.	97	75-125	04/24/18 12:20	
4-Bromofluorobenzene (S)	%.	98	75-125	04/24/18 12:20	
Toluene-d8 (S)	%.	93	75-125	04/24/18 12:20	

LABORATORY CONTROL SAMPLE: 2901054

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Trihalomethanes (Calc.)	ug/L	80	84.4	105	70-130	
1,2-Dichloroethane-d4 (S)	%.			99	75-125	
4-Bromofluorobenzene (S)	%.			98	75-125	
Toluene-d8 (S)	%.			96	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2902553 2902554

Parameter	Units	10428490001		2902554		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Total Trihalomethanes (Calc.)	ug/L	ND	80	80	79.2	81.9	99	102	70-130	3	20
1,2-Dichloroethane-d4 (S)	%.						97	100	75-125		
4-Bromofluorobenzene (S)	%.						99	98	75-125		
Toluene-d8 (S)	%.						96	94	75-125		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 442244 Analysis Method: EPA 548.1
QC Batch Method: EPA 548.1 Analysis Description: 548 GCS Endothall
Associated Lab Samples: 10428032001, 10428032003, 10428032004

METHOD BLANK: 2399870 Matrix: Water
Associated Lab Samples: 10428032001, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Endothall	ug/L	ND	9.0	04/25/18 07:43	

LABORATORY CONTROL SAMPLE: 2399871

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	50	55.6	111	64-137	

LABORATORY CONTROL SAMPLE: 2399872

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Endothall	ug/L	9	7.7J	85	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2400302 2400303

Parameter	Units	35387642002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	34.7	42.5	69	85	64-137	20	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401760 2401761

Parameter	Units	35387858001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Endothall	ug/L	4.3U	50	50	43.1	33.6	86	67	64-137	25	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 442497 Analysis Method: EPA 549.2
QC Batch Method: EPA 549.2 Analysis Description: 549 HPLC Paraquat Diquat
Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2400903 Matrix: Water
Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diquat	ug/L	ND	0.40	04/25/18 12:31	
Paraquat	ug/L	ND	0.40	04/25/18 12:31	

LABORATORY CONTROL SAMPLE: 2400904

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	2	1.8	92	70-130	
Paraquat	ug/L	2	1.7	85	70-130	

LABORATORY CONTROL SAMPLE: 2400905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diquat	ug/L	.4	0.59	147	50-150	
Paraquat	ug/L	.4	0.42	105	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401428 2401429

Parameter	Units	35387355001 Result	MS Spike Conc.	MSD Spike Conc.	2401428		2401429		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.0	1.9	98	93	70-130	6	30	
Paraquat	ug/L	<0.30	2	2	1.8	1.6	90	82	70-130	9	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2401430 2401431

Parameter	Units	35387355002 Result	MS Spike Conc.	MSD Spike Conc.	2401430		2401431		% Rec Limits	RPD	Max RPD	Qual
					MS Result	MSD Result	MS % Rec	MSD % Rec				
Diquat	ug/L	<0.30	2	2	2.1	2.1	103	107	70-130	4	30	
Paraquat	ug/L	<0.30	2	2	1.9	1.9	94	93	70-130	2	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 443467 Analysis Method: EPA 552.3
QC Batch Method: EPA 552.3 Analysis Description: 5523 Haloacetic Acids
Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2405897 Matrix: Water

Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromoacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
Dichloroacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
Haloacetic Acids (Total)	ug/L	ND	1.0	05/01/18 11:24	
Monobromoacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
Monochloroacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
Trichloroacetic Acid	ug/L	ND	1.0	05/01/18 11:24	
2,3-Dibromopropanoic Acid (S)	%	113	70-130	05/01/18 11:24	

LABORATORY CONTROL SAMPLE: 2405898

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromoacetic Acid	ug/L	10	10.7	107	70-130	
Dichloroacetic Acid	ug/L	10	10.7	107	70-130	
Haloacetic Acids (Total)	ug/L	50	55.3	111	70-130	
Monobromoacetic Acid	ug/L	10	10.8	108	70-130	
Monochloroacetic Acid	ug/L	10	11.6	116	70-130	
Trichloroacetic Acid	ug/L	10	11.4	114	70-130	
2,3-Dibromopropanoic Acid (S)	%			97	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2406753 2406754

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35387664001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	2.1	10	10	13.1	12.8	110	107	70-130	3	30	
Dichloroacetic Acid	ug/L	25.2	10	10	34.7	40.2	95	150	70-130	15	30	M1
Haloacetic Acids (Total)	ug/L	46.1	50	50	113	116	135	139	70-130	2	30	
Monobromoacetic Acid	ug/L	<0.29	10	10	14.0	13.1	140	131	70-130	6	30	M1
Monochloroacetic Acid	ug/L	<0.90	10	10	18.6	16.4	186	164	70-130	13	30	M1
Trichloroacetic Acid	ug/L	18.9	10	10	33.0	33.1	142	143	70-130	0	30	M1
2,3-Dibromopropanoic Acid (S)	%						113	109	70-130		30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2406755 2406756

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		35387664002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Dibromoacetic Acid	ug/L	2.3	10	10	12.9	12.5	106	102	70-130	3	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Parameter	Units	2406755		2406756		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
		35387664002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						MSD Result	RPD	
Dichloroacetic Acid	ug/L	31.4	10	10	43.0	44.8	116	134	70-130	4	30	M1	
Haloacetic Acids (Total)	ug/L	55.9	50	50	121	122	130	133	70-130	1	30		
Monobromoacetic Acid	ug/L	<0.29	10	10	13.7	13.8	137	138	70-130	1	30	M1	
Monochloroacetic Acid	ug/L	<0.90	10	10	17.8	17.4	178	174	70-130	2	30	M1	
Trichloroacetic Acid	ug/L	22.2	10	10	33.3	33.9	112	117	70-130	2	30		
2,3-Dibromopropanoic Acid (S)	%						113	112	70-130		30		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 534073 Analysis Method: EPA 8011
QC Batch Method: EPA 8011 Analysis Description: GCS 8011 EDB DBCP
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2901365 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	ND	0.010	04/24/18 22:05	
1,2-Dibromoethane (EDB)	ug/L	ND	0.010	04/24/18 22:05	
4-Bromofluorobenzene (S)	%.	102	30-150	04/24/18 22:05	

LABORATORY CONTROL SAMPLE & LCSD: 2901366

Parameter	Units	2901367								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-chloropropane	ug/L	.11	0.10	0.097	95	89	60-140	7	20	
1,2-Dibromoethane (EDB)	ug/L	.11	0.11	0.10	100	94	60-140	6	20	
4-Bromofluorobenzene (S)	%.				107	106	30-150			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533542 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898180 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDE	ug/L	ND	0.10	04/25/18 19:54	
4,4'-DDT	ug/L	ND	0.10	04/25/18 19:54	
Aldrin	ug/L	ND	0.050	04/25/18 19:54	
alpha-BHC	ug/L	ND	0.050	04/25/18 19:54	
alpha-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
beta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Chlordane (Technical)	ug/L	ND	0.50	04/25/18 19:54	
delta-BHC	ug/L	ND	0.050	04/25/18 19:54	
Dieldrin	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan I	ug/L	ND	0.050	04/25/18 19:54	
Endosulfan II	ug/L	ND	0.10	04/25/18 19:54	
Endosulfan sulfate	ug/L	ND	0.10	04/25/18 19:54	
Endrin	ug/L	ND	0.10	04/25/18 19:54	
Endrin aldehyde	ug/L	ND	0.10	04/25/18 19:54	
Endrin ketone	ug/L	ND	0.10	04/25/18 19:54	
gamma-BHC (Lindane)	ug/L	ND	0.050	04/25/18 19:54	
gamma-Chlordane	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor	ug/L	ND	0.050	04/25/18 19:54	
Heptachlor epoxide	ug/L	ND	0.050	04/25/18 19:54	
Methoxychlor	ug/L	ND	0.50	04/25/18 19:54	
Toxaphene	ug/L	ND	1.5	04/25/18 19:54	
Decachlorobiphenyl (S)	%	75	30-143	04/25/18 19:54	
Tetrachloro-m-xylene (S)	%	80	62-125	04/25/18 19:54	

LABORATORY CONTROL SAMPLE & LCSD: 2898181

Parameter	Units	2898182							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	0.95	104	95	67-125	10	20		
4,4'-DDE	ug/L	1	1.0	0.90	100	90	68-125	11	20		
4,4'-DDT	ug/L	1	0.92	0.83	92	83	66-125	10	20		
Aldrin	ug/L	.5	0.21	0.17	42	34	46-125	21	20	L2,R1	
alpha-BHC	ug/L	.5	0.50	0.45	101	90	66-125	11	20		
alpha-Chlordane	ug/L	.5	0.49	0.43	97	86	72-125	12	20		
beta-BHC	ug/L	.5	0.49	0.45	99	89	72-125	10	20		
delta-BHC	ug/L	.5	0.42	0.37	83	75	37-141	11	20		
Dieldrin	ug/L	1	1.1	1.0	112	100	71-125	11	20		
Endosulfan I	ug/L	.5	0.48	0.43	96	86	69-125	10	20		
Endosulfan II	ug/L	1	1.1	0.98	108	98	73-125	10	20		
Endosulfan sulfate	ug/L	1	0.96	0.87	96	87	63-127	9	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Parameter	Units	2898181		2898182			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	0.92	103	92	72-125	11	20	
Endrin aldehyde	ug/L	1	1.0	0.92	101	92	70-125	10	20	
Endrin ketone	ug/L	1	1.1	0.98	108	98	72-127	10	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.45	101	91	69-125	11	20	
gamma-Chlordane	ug/L	.5	0.43	0.38	86	75	64-125	14	20	
Heptachlor	ug/L	.5	0.34	0.28	67	57	54-125	17	20	
Heptachlor epoxide	ug/L	.5	0.50	0.45	101	90	72-125	11	20	
Methoxychlor	ug/L	5	4.6	4.2	92	84	67-127	9	20	
Decachlorobiphenyl (S)	%				80	76	30-143			
Tetrachloro-m-xylene (S)	%				85	70	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533544 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898185 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/23/18 14:24	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/23/18 14:24	
Decachlorobiphenyl (S)	%	105	30-125	04/23/18 14:24	CH
Tetrachloro-m-xylene (S)	%	50	30-125	04/23/18 14:24	

LABORATORY CONTROL SAMPLE & LCSD: 2898186 2898187

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.1	1.5	55	73	47-125	28	20	R1
PCB-1260 (Aroclor 1260)	ug/L	2	1.2	1.7	62	84	54-125	30	20	R1
Decachlorobiphenyl (S)	%				78	103	30-125			CH
Tetrachloro-m-xylene (S)	%				46	60	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533843 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2899581 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
1,2-Dichlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
1,2-Diphenylhydrazine	ug/L	ND	10.0	05/03/18 16:45	
1,3-Dichlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
1,4-Dichlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
1-Methylnaphthalene	ug/L	ND	10.0	05/03/18 16:45	
2,4,5-Trichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4,6-Trichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dimethylphenol	ug/L	ND	50.0	05/03/18 16:45	
2,4-Dinitrophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dinitrotoluene	ug/L	ND	10.0	05/03/18 16:45	
2,6-Dinitrotoluene	ug/L	ND	10.0	05/03/18 16:45	
2-Chloronaphthalene	ug/L	ND	10.0	05/03/18 16:45	
2-Chlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2-Methylnaphthalene	ug/L	ND	10.0	05/03/18 16:45	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	05/03/18 16:45	
2-Nitroaniline	ug/L	ND	10.0	05/03/18 16:45	
2-Nitrophenol	ug/L	ND	10.0	05/03/18 16:45	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	05/03/18 16:45	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	05/03/18 16:45	
3-Nitroaniline	ug/L	ND	10.0	05/03/18 16:45	
4,6-Dinitro-2-methylphenol	ug/L	ND	10.0	05/03/18 16:45	
4-Bromophenylphenyl ether	ug/L	ND	10.0	05/03/18 16:45	
4-Chloro-3-methylphenol	ug/L	ND	10.0	05/03/18 16:45	
4-Chloroaniline	ug/L	ND	50.0	05/03/18 16:45	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	05/03/18 16:45	
4-Nitroaniline	ug/L	ND	10.0	05/03/18 16:45	
4-Nitrophenol	ug/L	ND	10.0	05/03/18 16:45	
Acenaphthene	ug/L	ND	10.0	05/03/18 16:45	
Acenaphthylene	ug/L	ND	10.0	05/03/18 16:45	
Anthracene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(a)anthracene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(a)pyrene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(b)fluoranthene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(g,h,i)perylene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(k)fluoranthene	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Chloroisopropyl) ether	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	05/03/18 16:45	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

METHOD BLANK: 2899581

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Carbazole	ug/L	ND	10.0	05/03/18 16:45	
Chrysene	ug/L	ND	10.0	05/03/18 16:45	
Di-n-butylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Di-n-octylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Dibenz(a,h)anthracene	ug/L	ND	10.0	05/03/18 16:45	
Dibenzofuran	ug/L	ND	10.0	05/03/18 16:45	
Diethylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Dimethylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Fluoranthene	ug/L	ND	10.0	05/03/18 16:45	
Fluorene	ug/L	ND	10.0	05/03/18 16:45	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	05/03/18 16:45	
Hexachlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
Hexachloroethane	ug/L	ND	10.0	05/03/18 16:45	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10.0	05/03/18 16:45	
Isophorone	ug/L	ND	10.0	05/03/18 16:45	
N-Nitroso-di-n-propylamine	ug/L	ND	10.0	05/03/18 16:45	
N-Nitrosodimethylamine	ug/L	ND	10.0	05/03/18 16:45	
N-Nitrosodiphenylamine	ug/L	ND	10.0	05/03/18 16:45	
Naphthalene	ug/L	ND	10.0	05/03/18 16:45	
Nitrobenzene	ug/L	ND	10.0	05/03/18 16:45	
Pentachlorophenol	ug/L	ND	20.0	05/03/18 16:45	
Phenanthrene	ug/L	ND	10.0	05/03/18 16:45	
Phenol	ug/L	ND	10.0	05/03/18 16:45	
Pyrene	ug/L	ND	10.0	05/03/18 16:45	
2,4,6-Tribromophenol (S)	%	89	65-125	05/03/18 16:45	
2-Fluorobiphenyl (S)	%	79	56-125	05/03/18 16:45	
2-Fluorophenol (S)	%	82	55-125	05/03/18 16:45	
Nitrobenzene-d5 (S)	%	86	60-125	05/03/18 16:45	
p-Terphenyl-d14 (S)	%	92	58-125	05/03/18 16:45	
Phenol-d6 (S)	%	85	58-125	05/03/18 16:45	

LABORATORY CONTROL SAMPLE & LCSD: 2899582

2899583

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	50	40.5	42.4	81	85	54-125	4	20	
1,2-Dichlorobenzene	ug/L	50	35.3	38.5	71	77	35-125	9	20	
1,2-Diphenylhydrazine	ug/L	50	45.2	48.7	90	97	68-125	8	20	
1,3-Dichlorobenzene	ug/L	50	33.3	35.2	67	70	30-125	5	20	
1,4-Dichlorobenzene	ug/L	50	34.4	36.3	69	73	33-125	5	20	
1-Methylnaphthalene	ug/L	50	42.3	44.1	85	88	67-125	4	20	
2,4,5-Trichlorophenol	ug/L	50	43.7	48.6	87	97	74-125	11	20	
2,4,6-Trichlorophenol	ug/L	50	43.7	48.0	87	96	74-125	9	20	
2,4-Dichlorophenol	ug/L	50	42.8	45.4	86	91	68-125	6	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

LABORATORY CONTROL SAMPLE & LCSD: 2899582		2899583									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4-Dimethylphenol	ug/L	50	38.8J	42.1J	78	84	33-125		20		
2,4-Dinitrophenol	ug/L	50	11.9	16.0	24	32	30-127	29	20	L2,R1	
2,4-Dinitrotoluene	ug/L	50	42.8	47.5	86	95	75-125	10	20		
2,6-Dinitrotoluene	ug/L	50	43.2	47.4	86	95	75-125	9	20		
2-Chloronaphthalene	ug/L	50	43.0	46.1	86	92	70-125	7	20		
2-Chlorophenol	ug/L	50	41.8	45.0	84	90	61-125	7	20		
2-Methylnaphthalene	ug/L	50	42.0	44.9	84	90	67-125	7	20		
2-Methylphenol(o-Cresol)	ug/L	50	41.6	45.2	83	90	63-125	8	20		
2-Nitroaniline	ug/L	50	46.4	48.9	93	98	73-125	5	20		
2-Nitrophenol	ug/L	50	40.5	43.8	81	88	64-125	8	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.4	45.9	87	92	67-125	6	20		
3,3'-Dichlorobenzidine	ug/L	50	47J	46J	94	92	60-125		20	4M	
3-Nitroaniline	ug/L	50	45.4	44.4	91	89	73-125	2	20		
4,6-Dinitro-2-methylphenol	ug/L	50	8.6J	13.1	17	26	42-127		20	L2	
4-Bromophenylphenyl ether	ug/L	50	43.7	45.7	87	91	75-125	5	20		
4-Chloro-3-methylphenol	ug/L	50	44.0	46.3	88	93	75-125	5	20		
4-Chloroaniline	ug/L	50	38.5J	37.4J	77	75	60-125		20		
4-Chlorophenylphenyl ether	ug/L	50	43.5	47.8	87	96	74-125	9	20		
4-Nitroaniline	ug/L	50	45.4	48.9	91	98	69-125	8	20		
4-Nitrophenol	ug/L	50	46.9	51.2	94	102	62-125	9	20		
Acenaphthene	ug/L	50	42.5	46.5	85	93	74-125	9	20		
Acenaphthylene	ug/L	50	43.9	47.6	88	95	72-125	8	20		
Anthracene	ug/L	50	45.0	47.3	90	95	75-125	5	20		
Benzo(a)anthracene	ug/L	50	45.2	47.6	90	95	75-125	5	20		
Benzo(a)pyrene	ug/L	50	45.5	48.0	91	96	75-125	5	20		
Benzo(b)fluoranthene	ug/L	50	47.6	49.8	95	100	75-125	5	20		
Benzo(g,h,i)perylene	ug/L	50	44.6	46.3	89	93	73-125	4	20		
Benzo(k)fluoranthene	ug/L	50	45.7	48.6	91	97	75-125	6	20		
bis(2-Chloroethoxy)methane	ug/L	50	43.0	45.8	86	92	67-125	6	20		
bis(2-Chloroethyl) ether	ug/L	50	42.8	46.3	86	93	55-125	8	20		
bis(2-Chloroisopropyl) ether	ug/L	50	42.8	44.7	86	89	52-125	4	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	46.9	48.2	94	96	72-129	3	20		
Butylbenzylphthalate	ug/L	50	46.3	48.6	93	97	69-127	5	20		
Carbazole	ug/L	50	45.9	47.8	92	96	75-125	4	20		
Chrysene	ug/L	50	46.7	47.3	93	95	75-125	1	20		
Di-n-butylphthalate	ug/L	50	46.3	48.3	93	97	75-125	4	20		
Di-n-octylphthalate	ug/L	50	47.0	48.7	94	97	69-131	4	20		
Dibenz(a,h)anthracene	ug/L	50	44.9	46.7	90	93	74-125	4	20		
Dibenzofuran	ug/L	50	43.7	47.4	87	95	75-125	8	20		
Diethylphthalate	ug/L	50	45.2	49.6	90	99	75-125	9	20		
Dimethylphthalate	ug/L	50	44.6	49.1	89	98	75-125	10	20		
Fluoranthene	ug/L	50	45.9	48.1	92	96	75-125	5	20		
Fluorene	ug/L	50	45.0	48.1	90	96	75-125	7	20		
Hexachloro-1,3-butadiene	ug/L	50	38.8	41.6	78	83	37-125	7	20		
Hexachlorobenzene	ug/L	50	44.0	47.3	88	95	74-125	7	20		
Hexachloroethane	ug/L	50	29.1	31.4	58	63	30-125	8	20		
Indeno(1,2,3-cd)pyrene	ug/L	50	44.5	46.4	89	93	74-125	4	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

LABORATORY CONTROL SAMPLE & LCSD: 2899582		2899583								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Isophorone	ug/L	50	42.9	45.7	86	91	72-125	6	20	
N-Nitroso-di-n-propylamine	ug/L	50	43.3	46.7	87	93	65-125	8	20	
N-Nitrosodimethylamine	ug/L	50	43.0	47.3	86	95	52-125	10	20	
N-Nitrosodiphenylamine	ug/L	50	45.1	46.5	90	93	75-125	3	20	
Naphthalene	ug/L	50	41.7	43.8	83	88	58-125	5	20	
Nitrobenzene	ug/L	50	43.1	45.3	86	91	64-125	5	20	
Pentachlorophenol	ug/L	50	40.2	43.5	80	87	52-125	8	20	
Phenanthrene	ug/L	50	44.9	47.2	90	94	75-125	5	20	
Phenol	ug/L	50	41.9	45.7	84	91	59-125	9	20	
Pyrene	ug/L	50	45.8	47.8	92	96	75-125	4	20	
2,4,6-Tribromophenol (S)	%				89	97	65-125			
2-Fluorobiphenyl (S)	%				71	78	56-125			
2-Fluorophenol (S)	%				78	85	55-125			
Nitrobenzene-d5 (S)	%				84	88	60-125			
p-Terphenyl-d14 (S)	%				90	93	58-125			
Phenol-d6 (S)	%				82	89	58-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 21096 Analysis Method: EPA 8315A
QC Batch Method: EPA 8315A Analysis Description: 8315 GCSV Aldehydes
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 84138 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Formaldehyde	ug/L	ND	100	04/26/18 12:42	

LABORATORY CONTROL SAMPLE: 84139

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Formaldehyde	ug/L	400	404	101	44-176	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 84140 84141

Parameter	Units	4611147001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Formaldehyde	ug/L	7450	400	400	8530	8420	269	242	35-167	1	20	M6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533559

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898263

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/25/18 13:36	B4

LABORATORY CONTROL SAMPLE: 2898265

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	166	84	85-115	B4

SAMPLE DUPLICATE: 2898266

Parameter	Units	10428032001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	11.2	11.0	3	20	B4

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 535555 Analysis Method: EPA 1664A OG
 QC Batch Method: EPA 1664A OG Analysis Description: 1664 HEM, Oil and Grease
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2910693 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	05/02/18 11:26	

LABORATORY CONTROL SAMPLE & LCSD: 2910694 2910859

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	40	36.1	37.4	90	94	78-114	4	18	

MATRIX SPIKE SAMPLE: 2910696

Parameter	Units	10428562001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	13.0	41.2	44.7	77	78-114	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533531 Analysis Method: EPA 180.1

QC Batch Method: EPA 180.1 Analysis Description: 180.1 Turbidity

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898133 Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/20/18 11:33	1M

LABORATORY CONTROL SAMPLE: 2898134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.3	99	90-110	

SAMPLE DUPLICATE: 2898135

Parameter	Units	10428032004 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	152	146	4	20	

SAMPLE DUPLICATE: 2898156

Parameter	Units	10428032003 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	196	230	16	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 534218

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2902503

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/25/18 13:32	

LABORATORY CONTROL SAMPLE: 2902504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	92.0	92	80-120	

SAMPLE DUPLICATE: 2902505

Parameter	Units	10428086001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	215	214	0	10	

SAMPLE DUPLICATE: 2902506

Parameter	Units	10428170001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	161	166	3	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 442752

Analysis Method: SM 4500-CIO2

QC Batch Method: SM 4500-CIO2

Analysis Description: 4500CIO2 Chlorine Dioxide

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2402049

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorine Dioxide	mg/L	ND	0.10	04/25/18 13:30	H6

LABORATORY CONTROL SAMPLE: 2402050

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorine Dioxide	mg/L	2.5	2.3	95	90-110	H6

SAMPLE DUPLICATE: 2402051

Parameter	Units	10427276001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorine Dioxide	mg/L	1.6	1.6	1	20	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 534745 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

LABORATORY CONTROL SAMPLE: 2905104

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	99	98-102	H6

SAMPLE DUPLICATE: 2905105

Parameter	Units	10427644001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.0	1	3	H6

SAMPLE DUPLICATE: 2905106

Parameter	Units	10427668001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 534208 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2902477 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/25/18 13:44	

LABORATORY CONTROL SAMPLE: 2902478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2902479 2902480

Parameter	Units	10428289001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.5	12.5	12.5	13.0	12.9	92	92	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2902481 2902482

Parameter	Units	10429393001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	36.1	12.5	12.5	43.7	40.9	61	39	90-110	7	20	M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 535414 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2909828 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	05/02/18 11:48	FS

LABORATORY CONTROL SAMPLE: 2909829

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.92	92	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2909830 2909831

Parameter	Units	10428106013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.62	1	1	1.5	1.5	90	88	90-110	1	20	M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2909832 2909833

Parameter	Units	10428536005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	ND	1	1	1.0	1.0	98	99	90-110	1	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 443383 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2405368 Matrix: Water
Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorite	ug/L	ND	5.0	04/27/18 11:59	

LABORATORY CONTROL SAMPLE: 2405369

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	40	38.6	96	85-115	

MATRIX SPIKE SAMPLE: 2405371

Parameter	Units	10428032001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chlorite	ug/L	ND	8000	7560	94	75-125	

SAMPLE DUPLICATE: 2405370

Parameter	Units	10428032001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chlorite	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 442670 Analysis Method: EPA 300.1
QC Batch Method: EPA 300.1 Analysis Description: 300.1 Oxihalides IC Anions
Associated Lab Samples: 10428032001, 10428032003

METHOD BLANK: 2401827 Matrix: Water
Associated Lab Samples: 10428032001, 10428032003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Bromate	ug/L	ND	1.0	04/25/18 15:18	

LABORATORY CONTROL SAMPLE: 2401828

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	8	7.7	96	85-115	

MATRIX SPIKE SAMPLE: 2401830

Parameter	Units	10428032001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	ND	80	82.9	104	75-125	

MATRIX SPIKE SAMPLE: 2403834

Parameter	Units	35388186001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromate	ug/L	64.0U	400	349	87	75-125	

SAMPLE DUPLICATE: 2401829

Parameter	Units	10428032001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	ND	ND		20	

SAMPLE DUPLICATE: 2403833

Parameter	Units	35388186001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromate	ug/L	64.0U	ND		20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533560

Analysis Method: SM 3500-Cr B Modified

QC Batch Method: SM 3500-Cr B Modified

Analysis Description: Chromium, Hexavalent by 3500

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898271

Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/20/18 13:48	FS

LABORATORY CONTROL SAMPLE: 2898272

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	106	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898273 2898274

Parameter	Units	10428032004		2898273		2898274		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Chromium, Hexavalent	mg/L	ND	.2	.2	.2	0.012	0.012	2	2	85-115	4 20 FS,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 141457 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 559466 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	04/27/18 13:12	

LABORATORY CONTROL SAMPLE: 559467

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559468 559469

Parameter	Units	10428145001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	5	5.3	5	5.4	105	107	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 559470 559471

Parameter	Units	12107585005 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	5	5.0	5	5.2	100	104	90-110	4	10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 533564 Analysis Method: EPA 353.2
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2898336 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/20/18 14:00	FS
Nitrite as N	mg/L	ND	0.020	04/20/18 14:00	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/20/18 14:00	FS

LABORATORY CONTROL SAMPLE: 2898337

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	1.0	100	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.98	98	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898338 2898339

Parameter	Units	10428032002		2898338		2898339		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
Nitrite as N	mg/L	0.027	1	1	0.90	0.92	87	89	90-110	2	20	FS, M1		
Nitrogen, NO2 plus NO3	mg/L	0.11	1	1	0.92	0.95	81	85	90-110	4	20	FS, M1		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 21467 Analysis Method: EPA 9016
 QC Batch Method: EPA 9016 Analysis Description: 9016 Free Cyanide
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 85665 Matrix: Water
 Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/27/18 19:56	

LABORATORY CONTROL SAMPLE: 85666

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	154	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 85667 85668

Parameter	Units	10428166001		85668		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Cyanide, Free	ug/L	ND	150	150	154	103	107	80-120	4	11	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 534468 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2903673 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/27/18 09:57	

LABORATORY CONTROL SAMPLE: 2903674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	258	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903675 2903676

Parameter	Units	10428172001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	10.1	250	250	238	242	91	93	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903677 2903678

Parameter	Units	10428174001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	10.6	250	250	241	242	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

QC Batch: 535279 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 2909010 Matrix: Water
Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.10	05/02/18 09:52	

LABORATORY CONTROL SAMPLE: 2909011

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2909012 2909013

Parameter	Units	10428985001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	ND	1	1	1.0	1.2	104	118	80-120	13	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2909014 2909015

Parameter	Units	10428376001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Phosphorus	mg/L	0.30	1	1	1.3	1.3	95	103	80-120	7	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Sample: FL-TT-03		Lab ID: 10428032001	Collected: 04/19/18 09:30	Received: 04/20/18 08:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	5.81 ± 3.02 (4.06)		pCi/L	05/15/18 19:45	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	9.38 ± 3.53 (4.98)		pCi/L	05/15/18 19:45	12587-47-2	
		C:NA T:NA					
Radium-226	EPA 903.1	0.190 ± 0.512 (0.950)		pCi/L	05/08/18 19:15	13982-63-3	
		C:NA T:84%					
Radium-228	EPA 904.0	0.0206 ± 0.477 (1.11)		pCi/L	05/11/18 11:17	15262-20-1	
		C:58% T:65%					
Total Radium	Total Radium Calculation	0.211 ± 0.989 (2.06)		pCi/L	05/15/18 10:56	7440-14-4	

Sample: FL-TT-04		Lab ID: 10428032002	Collected: 04/19/18 13:00	Received: 04/20/18 08:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	4.78 ± 2.20 (3.10)		pCi/L	05/09/18 19:19	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	7.32 ± 1.94 (2.11)		pCi/L	05/09/18 19:19	12587-47-2	
		C:NA T:NA					
Radium-226	EPA 903.1	-0.125 ± 0.301 (0.753)		pCi/L	05/08/18 19:29	13982-63-3	
		C:NA T:86%					
Radium-228	EPA 904.0	1.01 ± 0.594 (1.08)		pCi/L	05/11/18 11:17	15262-20-1	
		C:78% T:48%					
Total Radium	Total Radium Calculation	1.01 ± 0.895 (1.83)		pCi/L	05/15/18 10:56	7440-14-4	

Sample: FL-TT-05		Lab ID: 10428032003	Collected: 04/19/18 15:45	Received: 04/20/18 08:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	9.07 ± 2.50 (2.36)		pCi/L	05/09/18 19:19	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	8.72 ± 1.93 (1.45)		pCi/L	05/09/18 19:19	12587-47-2	
		C:NA T:NA					
Radium-226	EPA 903.1	0.189 ± 0.446 (0.826)		pCi/L	05/08/18 19:29	13982-63-3	
		C:NA T:84%					
Radium-228	EPA 904.0	0.368 ± 0.380 (0.789)		pCi/L	05/11/18 11:17	15262-20-1	
		C:80% T:76%					
Total Radium	Total Radium Calculation	0.557 ± 0.826 (1.62)		pCi/L	05/15/18 10:56	7440-14-4	

Sample: FL-TT-07		Lab ID: 10428032004	Collected: 04/19/18 18:03	Received: 04/20/18 08:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	2.54 ± 1.66 (2.63)		pCi/L	05/09/18 19:19	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	7.15 ± 2.03 (2.41)		pCi/L	05/09/18 19:19	12587-47-2	
		C:NA T:NA					

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Sample: FL-TT-07 **Lab ID: 10428032004** Collected: 04/19/18 18:03 Received: 04/20/18 08:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.567 ± 0.501 (0.743) C:NA T:93%	pCi/L	05/08/18 19:29	13982-63-3	
Radium-228	EPA 904.0	0.500 ± 0.362 (0.706) C:82% T:83%	pCi/L	05/11/18 11:17	15262-20-1	
Total Radium	Total Radium Calculation	1.07 ± 0.863 (1.45)	pCi/L	05/15/18 10:56	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 296005 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 1449102 Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0211 ± 0.300 (0.695) C:85% T:77%	pCi/L	05/11/18 11:15	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch:	296913	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10428032002, 10428032003, 10428032004		

METHOD BLANK:	1453256	Matrix:	Water
Associated Lab Samples:	10428032002, 10428032003, 10428032004		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.297 ± 0.417 (1.39) C:NA T:NA	pCi/L	05/10/18 08:47	
Gross Beta	0.474 ± 0.723 (1.64) C:NA T:NA	pCi/L	05/10/18 08:47	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch:	298224	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10428032001		

METHOD BLANK:	1460179	Matrix:	Water
Associated Lab Samples:	10428032001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.360 ± 0.558 (1.21) C:NA T:NA	pCi/L	05/16/18 08:49	
Gross Beta	0.363 ± 0.780 (1.78) C:NA T:NA	pCi/L	05/16/18 08:49	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

QC Batch: 295988 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

METHOD BLANK: 1449064 Matrix: Water

Associated Lab Samples: 10428032001, 10428032002, 10428032003, 10428032004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.168 ± 0.257 (0.413) C:NA T:91%	pCi/L	05/08/18 19:01	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 533719

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533882

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 534052

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

BATCH QUALIFIERS

Batch: 534336

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 535555

[BE] Batch extracted by solid phase extraction (SPE).

ANALYTE QUALIFIERS

1M Analyte was detected in the method blank. All associated samples had concentrations of at least five times greater than the blank or were below the method detection limit.

2M Sample was yellow in color.

3M Surrogate recovery outside laboratory control limits due to emulsion

4M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

A Suspected aldol-condensation product (TICs).

B4 The glucose/glutamic acid standard exceeded the range of 198 plus or minus 30.5 mg/L.

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

IO The internal standard response was outside the laboratory acceptance limits confirmed by reanalysis. The results reported are from the most QC compliant analysis.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

S0 Surrogate recovery outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428032001	FL-TT-03				
10428032002	FL-TT-04				
10428032003	FL-TT-05				
10428032004	FL-TT-07				
10428032001	FL-TT-03	EPA 531.1	445530		
10428032003	FL-TT-05	EPA 531.1	445530		
10428032001	FL-TT-03	EPA 547	443841		
10428032002	FL-TT-04	EPA 547	443841		
10428032003	FL-TT-05	EPA 547	443841		
10428032004	FL-TT-07	EPA 547	443841		
10428032001	FL-TT-03	EPA 549.2	442497	EPA 549.2	442774
10428032003	FL-TT-05	EPA 549.2	442497	EPA 549.2	442774
10428032001	FL-TT-03	EPA 552.3	443467	EPA 552.3	443713
10428032003	FL-TT-05	EPA 552.3	443467	EPA 552.3	443713
10428032001	FL-TT-03	EPA 8011	534073	EPA 8011	534336
10428032002	FL-TT-04	EPA 8011	534073	EPA 8011	534336
10428032003	FL-TT-05	EPA 8011	534073	EPA 8011	534336
10428032004	FL-TT-07	EPA 8011	534073	EPA 8011	534336
10428032001	FL-TT-03	EPA 8015 Alcohol-Glycol	438905		
10428032002	FL-TT-04	EPA 8015 Alcohol-Glycol	438905		
10428032003	FL-TT-05	EPA 8015 Alcohol-Glycol	438905		
10428032004	FL-TT-07	EPA 8015 Alcohol-Glycol	438905		
10428032001	FL-TT-03	EPA 8015 Alcohol-Glycol	438816		
10428032002	FL-TT-04	EPA 8015 Alcohol-Glycol	438816		
10428032003	FL-TT-05	EPA 8015 Alcohol-Glycol	438816		
10428032004	FL-TT-07	EPA 8015 Alcohol-Glycol	438816		
10428032001	FL-TT-03	EPA Mod. 3510C	533542	EPA 8081B	534052
10428032002	FL-TT-04	EPA Mod. 3510C	533542	EPA 8081B	534052
10428032003	FL-TT-05	EPA Mod. 3510C	533542	EPA 8081B	534052
10428032004	FL-TT-07	EPA Mod. 3510C	533542	EPA 8081B	534052
10428032001	FL-TT-03	EPA Mod. 3510C	533544	EPA 8082A	533719
10428032002	FL-TT-04	EPA Mod. 3510C	533544	EPA 8082A	533719
10428032003	FL-TT-05	EPA Mod. 3510C	533544	EPA 8082A	533719
10428032004	FL-TT-07	EPA Mod. 3510C	533544	EPA 8082A	533719
10428032001	FL-TT-03	EPA 8315A	21096	EPA 8315A	21168
10428032002	FL-TT-04	EPA 8315A	21096	EPA 8315A	21168
10428032003	FL-TT-05	EPA 8315A	21096	EPA 8315A	21168
10428032004	FL-TT-07	EPA 8315A	21096	EPA 8315A	21168
10428032001	FL-TT-03	EPA 8316	21113		
10428032002	FL-TT-04	EPA 8316	21113		
10428032003	FL-TT-05	EPA 8316	21113		
10428032004	FL-TT-07	EPA 8316	21113		
10428032001	FL-TT-03	EPA 200.7	533435	EPA 200.7	534229

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428032002	FL-TT-04	EPA 200.7	533435	EPA 200.7	534229
10428032003	FL-TT-05	EPA 200.7	533435	EPA 200.7	534229
10428032004	FL-TT-07	EPA 200.7	533435	EPA 200.7	534229
10428032001	FL-TT-03	EPA 200.8	533691	EPA 200.8	533859
10428032002	FL-TT-04	EPA 200.8	533691	EPA 200.8	533859
10428032003	FL-TT-05	EPA 200.8	533691	EPA 200.8	533859
10428032004	FL-TT-07	EPA 200.8	533691	EPA 200.8	533859
10428032001	FL-TT-03	EPA 200.8	533428	EPA 200.8	533889
10428032002	FL-TT-04	EPA 200.8	533428	EPA 200.8	533889
10428032003	FL-TT-05	EPA 200.8	533428	EPA 200.8	533889
10428032004	FL-TT-07	EPA 200.8	533428	EPA 200.8	533889
10428032001	FL-TT-03	EPA 245.1	533449	EPA 245.1	533882
10428032002	FL-TT-04	EPA 245.1	533449	EPA 245.1	533882
10428032003	FL-TT-05	EPA 245.1	533449	EPA 245.1	533882
10428032004	FL-TT-07	EPA 245.1	533449	EPA 245.1	533882
10428032001	FL-TT-03	EPA 548.1	442244	EPA 548.1	442522
10428032003	FL-TT-05	EPA 548.1	442244	EPA 548.1	442522
10428032004	FL-TT-07	EPA 548.1	442244	EPA 548.1	442522
10428032001	FL-TT-03	EPA 3520	533843	EPA 8270D	534330
10428032002	FL-TT-04	EPA 3520	533843	EPA 8270D	534330
10428032003	FL-TT-05	EPA 3520	533843	EPA 8270D	534330
10428032004	FL-TT-07	EPA 3520	533843	EPA 8270D	534330
10428032001	FL-TT-03	EPA 524.2	534005		
10428032002	FL-TT-04	EPA 524.2	534005		
10428032003	FL-TT-05	EPA 524.2	534005		
10428032004	FL-TT-07	EPA 524.2	534005		
10428032001	FL-TT-03				
10428032002	FL-TT-04				
10428032003	FL-TT-05				
10428032004	FL-TT-07				
10428032001	FL-TT-03	EPA 900.0	298224		
10428032002	FL-TT-04	EPA 900.0	296913		
10428032003	FL-TT-05	EPA 900.0	296913		
10428032004	FL-TT-07	EPA 900.0	296913		
10428032001	FL-TT-03	EPA 903.1	295988		
10428032002	FL-TT-04	EPA 903.1	295988		
10428032003	FL-TT-05	EPA 903.1	295988		
10428032004	FL-TT-07	EPA 903.1	295988		
10428032001	FL-TT-03	EPA 904.0	296005		
10428032002	FL-TT-04	EPA 904.0	296005		
10428032003	FL-TT-05	EPA 904.0	296005		
10428032004	FL-TT-07	EPA 904.0	296005		
10428032001	FL-TT-03	Total Radium Calculation	298425		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428032

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428032002	FL-TT-04	Total Radium Calculation	298425		
10428032003	FL-TT-05	Total Radium Calculation	298425		
10428032004	FL-TT-07	Total Radium Calculation	298425		
10428032001	FL-TT-03	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428032002	FL-TT-04	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428032003	FL-TT-05	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428032004	FL-TT-07	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428032001	FL-TT-03	EPA 1664A OG	535555		
10428032002	FL-TT-04	EPA 1664A OG	535555		
10428032003	FL-TT-05	EPA 1664A OG	535555		
10428032004	FL-TT-07	EPA 1664A OG	535555		
10428032001	FL-TT-03	EPA 180.1	533531		
10428032002	FL-TT-04	EPA 180.1	533531		
10428032003	FL-TT-05	EPA 180.1	533531		
10428032004	FL-TT-07	EPA 180.1	533531		
10428032001	FL-TT-03	SM 2540D	534218		
10428032002	FL-TT-04	SM 2540D	534218		
10428032003	FL-TT-05	SM 2540D	534218		
10428032004	FL-TT-07	SM 2540D	534218		
10428032001	FL-TT-03	SM 4500-CIO2	442752		
10428032002	FL-TT-04	SM 4500-CIO2	442752		
10428032003	FL-TT-05	SM 4500-CIO2	442752		
10428032004	FL-TT-07	SM 4500-CIO2	442752		
10428032001	FL-TT-03	SM 4500-H+B	534745		
10428032002	FL-TT-04	SM 4500-H+B	534745		
10428032003	FL-TT-05	SM 4500-H+B	534745		
10428032004	FL-TT-07	SM 4500-H+B	534745		
10428032001	FL-TT-03	Trivalent Chromium Calculation	535426		
10428032002	FL-TT-04	Trivalent Chromium Calculation	535426		
10428032003	FL-TT-05	Trivalent Chromium Calculation	535426		
10428032004	FL-TT-07	Trivalent Chromium Calculation	535426		
10428032001	FL-TT-03	EPA 300.0	534208		
10428032001	FL-TT-03	EPA 300.0	535414		
10428032002	FL-TT-04	EPA 300.0	534208		
10428032002	FL-TT-04	EPA 300.0	535414		
10428032003	FL-TT-05	EPA 300.0	534208		
10428032003	FL-TT-05	EPA 300.0	535414		
10428032004	FL-TT-07	EPA 300.0	534208		
10428032004	FL-TT-07	EPA 300.0	535414		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428032

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428032001	FL-TT-03	EPA 300.1	443383		
10428032003	FL-TT-05	EPA 300.1	443383		
10428032001	FL-TT-03	EPA 300.1	442670		
10428032003	FL-TT-05	EPA 300.1	442670		
10428032001	FL-TT-03	SM 3500-Cr B Modified	533560		
10428032002	FL-TT-04	SM 3500-Cr B Modified	533560		
10428032003	FL-TT-05	SM 3500-Cr B Modified	533560		
10428032004	FL-TT-07	SM 3500-Cr B Modified	533560		
10428032001	FL-TT-03	EPA 350.1			
10428032002	FL-TT-04	EPA 350.1			
10428032003	FL-TT-05	EPA 350.1			
10428032004	FL-TT-07	EPA 350.1			
10428032001	FL-TT-03	EPA 350.1 rev. 2 (1993)	141457	EPA 350.1 rev. 2 (1993)	141577
10428032002	FL-TT-04	EPA 350.1 rev. 2 (1993)	141457	EPA 350.1 rev. 2 (1993)	141577
10428032003	FL-TT-05	EPA 350.1 rev. 2 (1993)	141457	EPA 350.1 rev. 2 (1993)	141577
10428032004	FL-TT-07	EPA 350.1 rev. 2 (1993)	141457	EPA 350.1 rev. 2 (1993)	141577
10428032001	FL-TT-03	EPA 353.2	533564		
10428032002	FL-TT-04	EPA 353.2	533564		
10428032003	FL-TT-05	EPA 353.2	533564		
10428032004	FL-TT-07	EPA 353.2	533564		
10428032001	FL-TT-03	EPA 9016	21467	EPA 9016	21631
10428032002	FL-TT-04	EPA 9016	21467	EPA 9016	21631
10428032003	FL-TT-05	EPA 9016	21467	EPA 9016	21631
10428032004	FL-TT-07	EPA 9016	21467	EPA 9016	21631
10428032001	FL-TT-03	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428032002	FL-TT-04	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428032003	FL-TT-05	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428032004	FL-TT-07	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428032001	FL-TT-03	SM 4500-P B	535279	SM 4500-P E	535335
10428032002	FL-TT-04	SM 4500-P B	535279	SM 4500-P E	535335
10428032003	FL-TT-05	SM 4500-P B	535279	SM 4500-P E	535335
10428032004	FL-TT-07	SM 4500-P B	535279	SM 4500-P E	535335

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WO#: 10428032



10428032

body Form	Work Order Number:	COC Type:	Page: 1 of 1
	Turnaround Time:	COC ID:	

CLIENT INFO	LABORATORY
Facility Code: MNSW057 / MPCA Freeway LF Waters	Lab Name:
Project Name: MPCA Freeway LF Waters	Address: 18-00383
Project Manager: Jennifer Anderson (Bca)	EPIC Profile # 38716
Potential Hazard? If yes, add information to Sampler Comments Section	Phone No:

FOR LAB USE ONLY
Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED					
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES			PRESERV.	ANALYSIS			Lab Sample No.	#
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)		# of Cont	List A	List B		
FL-TT-03	S	4/19/18	0930			G	NW	Wtr-Ground			41	X	X	X	001	1
FL-TT-04	S	4/19/18	1300			G	NW	Wtr-Ground			37	X	X	X	002	2
FL-TT-05	S	4/19/18	1545			G	NW	Wtr-Ground			41	X	X	X	003	3
FL-TT-07	S	4/19/18	1830			G	NW	Wtr-Ground			38	X	X	X	004	4
Blank rows 5-10																

Sampled By: Brad Jacobson / JAK / TSB Sampler's Signature: *Brad Jacobson* Phone #: 612-596-8277

Receiving Comments:	Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
	<i>[Signature]</i>	4-20-18/1830	<i>[Signature]</i> MPCA	4-20-18 830

T = 2.6, 3.0, 2.0, 2.5, 3.9, 3.6, 2.7, 4.0 °C

Sample Condition Upon Receipt **Client Name:** MPLA/FIELD **Project #:** **WO# : 10428032**

Courier: Fed Ex UPS USPS Client

Commercial Pace SpeeDee Other: _____

Tracking Number: _____

PM: JMA **Due Date: 05/04/18**

CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted

Used: G87A9155100842 **Cooler Temp Read (°C):** 2.6, 3.0, 2.0, 2.5 **Cooler Temp Corrected (°C):** 2.6, 3.0, 2.0, 2.5

Cooler Temp Read (°C): 3.4, 3.6, 2.7, 4.0 **Biological Tissue Frozen?** Yes No N/A

Temp should be above freezing to 6°C **Correction Factor:** TRUE **Date and Initials of Person Examining Contents:** WJP 4/20/18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <u>Y/N</u>
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1: 5/5</u> <u>2: 5/5</u> <u>3: 5/5</u> <u>4: 5/5</u>
(HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: <u>NO₃, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 04/20/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

March 22, 2018

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO3	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	EPA 8270C
PCBs	EPA 8082
PFCs	EPA 537
VOCs	EPA 8260 LL/SIM
1,4-Dioxane	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Harness detrmination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500CIO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

Chain of Custody

WO#: 10428032



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin:

Workorder: 10428032 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To						Requested Analysis													
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Nitrogen, unionized ammonia, as N									LAB USE ONLY		
						H2SO4															
1	FL-TT-03	PS	4/19/2018 09:30	10428032001	Water	1					X									001	
2	FL-TT-04	PS	4/19/2018 13:00	10428032002	Water	1					X									002	
3	FL-TT-05	PS	4/19/2018 15:45	10428032003	Water	1					X									003	
4	FL-TT-07	PS	4/19/2018 18:03	10428032004	Water	1					X									004	
5																					
Transfers												Comments									
Released By	Date/Time	Received By	Date/Time																		
<i>[Signature]</i>	4/23/18 1500	<i>[Signature]</i>	4.24.18	returning volume to MPLS																	
<i>[Signature]</i>	4.24.18	<i>[Signature]</i>	2315																		
<i>[Signature]</i>	4.25.18	<i>[Signature]</i>	1830																		
Cooler Temperature on Receipt 2.4 °C		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N															

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

T= 3.6

Sample Condition Upon Receipt

Client Name: Pace MPIS

Project #:

WO#: **10428032**

PM: JMA

Due Date: 05/04/18

CLIENT: PAST-MINFIELD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: true Date and Initials of Person Examining Contents: ME 4/25/18

USDA Regulated Soil N/A, water sample
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MIN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>Return Samples</u>
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-4</u> <u>4</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased):	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/26/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Sample Condition Upon Receipt

Client Name: Pace MN

Project #:

WO#: 12107529
 PM: HRZ Due Date: 05/04/18
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.4 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: ↑0.3 Date and Initials of Person Examining Contents: HRZ 4/24/18 DC

Comments: BM 4/25/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WF</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody



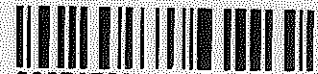
Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428032

Workorder Name: 18-00383 MPCA Freeway LF Water

Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To					Requested Analysis									
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600					<p style="text-align: center; font-size: 24pt; font-weight: bold;">WO#: 30250592</p>  <p style="text-align: center;">30250592</p>									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	Preserved Containers				Gross Alpha/Beta	Radium 226	Radium 228	Radium, total	LAB USE ONLY	
1	FL-TT-03	PS	4/19/2018 09:30	10428032001	Water	3					X	X	X	X	001	
2	FL-TT-04	PS	4/19/2018 13:00	10428032002	Water	3					X	X	X	X	002	
3	FL-TT-05	PS	4/19/2018 15:45	10428032003	Water	3					X	X	X	X	003	
4	FL-TT-07	PS	4/19/2018 18:03	10428032004	Water	3					X	X	X	X	004	
5																
Comments																
Transfers	Released By		Date/Time	Received By		Date/Time										
1	<i>[Signature]</i>		4/23/18	<i>[Signature]</i>		4/24/18 10:30										
2																
3																
Cooler Temperature on Receipt		- °C	Custody Seal		(Y) or N	Received on Ice		Y or (N)	Samples Intact						(Y) or N	

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

30250592

Face Analytical

Client Name: pace MN

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 9832 2632

Label <u>BH</u>
LIMS Login <u>BH</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N-A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>BH 4-24-18</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	/			5.
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used: -Pace Containers Used:	/			10.
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16. <u>PHL2</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>BH</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr			/	Initial when completed: <u>BH</u> Date: <u>4-24-18</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

WO#: 4611204



4611204

contracting Laboratory.

State Of Origin: MN



Workorder: 10428032 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451	Subcontract To Pace Analytical Grand Rapids 5560 Corporate Exchange Court Grand Rapids, MI 49512 USA Phone (616)975-4500	Requested Analysis											
---	---	--------------------	--	--	--	--	--	--	--	--	--	--	--

73-4

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Acrylamide EPA 8316 PDEFW	Cyanide, free SM-500CIG	Formaldehyde EPA 8315 PGRM	LAB USE ONLY																										
						Other	Unpreserved																																	
1	FL-TT-03	PS	4/19/2018 09:30	10428032001	Water	2	5						X	X	X																									
2	FL-TT-04	PS	4/19/2018 13:00	10428032002	Water	2	5						X	X	X																									
3	FL-TT-05	PS	4/19/2018 15:45	10428032003	Water	2	5						X	X	X																									
4	FL-TT-07	PS	4/19/2018 18:03	10428032004	Water	2	5						X	X	X																									
5																																								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>Angela Pace</i>	4/23/18 1530	<i>Patricia</i>	4/24/18 0830	
2					
3					

Cooler Temperature on Receipt _____ °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

SAMPLE RECEIVING / LOG-IN CHECKLIST



Client: <u>Pace Minnesota</u>	Work Order #: <u>4611204</u>
Receipt Record Page/Line #: <u>23-4</u>	

Recorded by (initials/date): <u>RS 4/24/18</u>	<input type="checkbox"/> Cooler	Qty Received: <u>2</u>	<input checked="" type="checkbox"/> IR Gun (#202)
	<input type="checkbox"/> Box		Thermometer Used <input type="checkbox"/> Digital Thermometer (#54)
	<input type="checkbox"/> Other		<input type="checkbox"/> IR Gun (#402)

Cooler #	Time	Cooler #	Time	Cooler #	Time
<u>Blue</u>	<u>0920</u>	<u>Red</u>	<u>0928</u>		
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact	
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None	
Coolant Location: Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom		Coolant Location: Dispersed / Top / Middle / Bottom	
Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative	
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C
Temp Blank:			Temp Blank:		
Sample 1: <u>1.1</u>	<u>1</u>	<u>1.1</u>	Sample 1: <u>0.4</u>	<u>1</u>	<u>0.4</u>
Sample 2: <u>1.0</u>	<u>1</u>	<u>1.0</u>	Sample 2: <u>0.6</u>	<u>1</u>	<u>0.6</u>
Sample 3: <u>1.09</u>	<u>1</u>	<u>1.09</u>	Sample 3: <u>1.7</u>	<u>1</u>	<u>1.7</u>
When above 6 °C take a 3 Sample Average °C: _____			When above 6 °C take a 3 Sample Average °C: _____		
<input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance

Paperwork Received

Yes No

Chain of Custody record(s)? If No, Initiated By _____
Received for Lab Signed/Date/Time?

USDA Soil Documents?

Sampling / Field Forms?

Other _____

COC Information

Pace COC Other _____

COC ID Numbers: _____

Check COC for Accuracy

Yes No

Analysis Requested?

Sample ID matches COC?

Sample Date and Time matches COC?

All containers indicated are received?

Sample Condition Summary

N/A	Yes	No	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Broken containers/lids?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Missing or incomplete labels?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Illegible information on labels?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Low volume received?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Inappropriate or non-Pace containers received?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	VOC vials have headspace?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Extra sample locations?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Containers not listed on COC?

Check Sample Preservation

N/A Yes No

Temperature Blank OR average sample temperature, ≥6 °C?

If "Yes" was thermal preservation required?

If "Yes" were ALL samples collected the same day as receipt?

Completed Sample Preservation Verification Form?

Samples chemically preserved correctly?

If "No", add wire tag and fill out Non-Conformance Form?

Received unpreserved Terracore kit?

If "Yes" unpreserved vials must be frozen

Work Order Not Logged In with Short Hold / Rush

Copies of COC To Lab Areas

Notes

Formaldehyde Air ore project

Yes No

Were all samples logged into Epic?

Were all samples labelled?

Were samples placed on scan locations?

Initial / Date : RS 4/24/18

AQUEOUS SAMPLE PRESERVATION VERIFICATION

Client: Pace Minnesota Work Order #: 4611204
 Receipt Log #: 23-4 Completed By (initials/date): PS 4/24/18

COC ID #		Adjusted by: _____ Date: _____												
Container Type	BP3C or AG30	BP1-4S		AG2S		BP1-4N Total		BP1-4N Dissolved						
Preservative	NaOH >12	H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1	✓	N/A												
COC Line #2	✓	↓												
COC Line #3	✓													
COC Line #4	✓	↓												
COC Line #5														
COC Line #6														
COC Line #7														
COC Line #8														
COC Line #9														
COC Line #10														
COC Line #11														
COC Line #12														

pH Strip Reagent or Lot #
 HC727135
 Other

Place a check mark in the Received box if pH is acceptable. If pH is not acceptable, document the Received and Adjusted pH values in the appropriate columns (project manager will review all adjustments at work order release). Never add more than 2x the default preservation volume (see table below for default volumes). Complete and attach a wire tag to all adjusted samples. A Sample Receiving Non-Conformance Report must be completed if a pH adjustment was required.

Comments:

COC ID #		Adjusted by: _____ Date: _____												
Container Type	BP3C or AG30	BP1-4S		AG2S		BP1-4N Total		BP1-4N Dissolved						
Preservative	NaOH >12	H ₂ SO ₄ <2		H ₂ SO ₄ <2		HNO ₃ <2		HNO ₃ <2						
pH	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted	Received	Adjusted
COC Line #1	✓	N/A												
COC Line #2	✓	↓												
COC Line #3														
COC Line #4														
COC Line #5														
COC Line #6														
COC Line #7														
COC Line #8														
COC Line #9														
COC Line #10														
COC Line #11														
COC Line #12														

Container Size (mL)	Default Preservative Volume (mL)
Container Types 5 / 23	NaOH
250	1.3
Container Type 4	H ₂ SO ₄
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H ₂ SO ₄
500	2.5
Container Types 6 / 15	HNO ₃
125	0.7
250	1.25
500	2.5
1000	5.0

Comments:



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-FL-C-007 rev. 12

Document Revised:
August 2, 2017
Issuing Authority:
Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #
Project Manager:
Client:

WO# : 35387887

PM: ADC **Due Date: 05/04/18**
CLIENT: PACMIN

Date and Initials of person:

Examining contents: KBI
Label: ALP
Deliver: _____
pH: _____

Thermometer Used: T337 **Date:** 4/24/18 **Time:** 1050 **Initials:** SS

State of Origin: _____

Cooler #1 Temp. °C 3.8 (Visual) +0.4 (Correction Factor) 4.2 (Actual) Samples on ice, cooling process has begun
Cooler #2 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
Cooler #3 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
Cooler #4 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
Cooler #5 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun
Cooler #6 Temp. °C _____ (Visual) _____ (Correction Factor) _____ (Actual) Samples on ice, cooling process has begun

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
Shipping Method: First Overnight Priority Overnight Standard Overnight Ground International Priority
 Other _____

Billing: Recipient Sender Third Party Credit Card Unknown

Tracking # 7475 9832

Custody Seal on Cooler/Box Present: Yes No **Seals intact:** Yes No **Ice:** Wet Blue Dry None

Packing Material: Bubble Wrap Bubble Bags None Other _____

Samples shorted to lab (If Yes, complete) **Shorted Date:** _____ **Shorted Time:** _____ **Qty:** _____

Comments:

Chain of Custody Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody Filled Out	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Relinquished Signature & Sampler Name COC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples Arrived within Hold Time	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush TAT requested on COC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient Volume	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct Containers Used	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Sample Labels match COC (sample IDs & date/time of collection)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing acid/base preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Preservation Information: Preservative: _____ Lot #/Trace #: _____ Date: _____ Time: _____ Initials: _____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA Vials? (>6mm):	<u>SBZ</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>See comments</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	

Client Notification/ Resolution:

Person Contacted: _____ **Date/Time:** 3B2 4/24/18

Comments/ Resolution (use back for additional comments): sample # 4 "FL-IT-07" has 1/2 547
nois with head space

Project Manager Review: Aaron Crump

Date: 04/24/18

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428032 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To		Subcontract To					Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					<div style="text-align: right; font-size: 2em; font-weight: bold;">50195165</div> <div style="text-align: right;">LAB USE ONLY</div>														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved											Preserved Containers				Methyl alcohol/Ethylene glycol/EPA
1	FL-TT-03	PS	4/19/2018 09:30	10428032001	Water	2															X
2	FL-TT-04	PS	4/19/2018 13:00	10428032002	Water	2															X
3	FL-TT-05	PS	4/19/2018 15:45	10428032003	Water	2															X
4	FL-TT-07	PS	4/19/2018 18:03	10428032004	Water	2					X										
5																					
Transfers												Comments									
Released By	Date/Time	Received By	Date/Time																		
<i>Miss J...</i>	4/19/18	<i>NO Felix</i>																			
<i>Felix</i>	4-24-18 0825	<i>JASON HEFF</i>	4-24-18 0825																		
Cooler Temperature on Receipt 3.9 °C		Custody Seal <input checked="" type="radio"/> or N			Received on Ice <input checked="" type="radio"/> or N			Samples Intact <input checked="" type="radio"/> or N													

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50195165

Date/Time and Initials of person examining contents: JH 4-24-18 1232

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7475 4832 2843

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: Wet Blue None | Samples collected today and on ice: Yes No N/A

Cooler Temperature: 3.9/3.4 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl. All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>				
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			<input checked="" type="checkbox"/>
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Labels Match COC?: Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:

Sample Container Count

WO#: 50195165



CLIENT: Pace MN

COC PAGE ___ of ___

COC ID# _____

Project # 50195165

SBS
Bulk Kit

Matrix S/W
(Soil/Water/
Aqueous Lic

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	Matrix S/W (Soil/Water/Aqueous Lic)	pH <2	pH >9	pH >12
1																		2	W+			
2																		2	W+			
3																		2	W+			
4																		2	W+			
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

May 03, 2018

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: 18-00383 MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/24/2018.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kari-Ann Killian For Jessica Esser
Project Manager

Certification List

			Expires
ADEQ	Arkansas Department of Environmental Quality	17-065-0	09/26/2018
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2019
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2018
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2018
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2018
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2018
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2017-154	08/31/2018
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2018
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2018



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-TT-07 (10428032004)	A181704-01	Water	04/19/2018	04/24/2018
FL-TT-03 (10428032001)	A181704-02	Water	04/19/2018	04/25/2018
FL-TT-04 (10428032002)	A181704-03	Water	04/19/2018	04/25/2018
FL-TT-05 (10428032003)	A181704-04	Water	04/19/2018	04/25/2018

CASE NARRATIVE

Sample Receipt Information:

1 sample was received on 04/24/2018. 3 samples were received on 04/25/2018. Samples were received at 3.1 and 2.5 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

The LC footnote on samples A181704-01 through A181704-04 states that there were low CCV recoveries for fonofos and prometon. The lower control limit is 80% and the lowest recoveries were 79.8% and 75.8%, respectively.

The LC footnote on samples A181704-03 through A181704-04 states that there was a low CCV recovery for 2,4-db. The lower control limit is 80% and the lowest recovery was 71.8%.

CCV also indicates a potential high bias for triallate for samples A181704-01 through A181704-04. Samples were less than the reporting limit for this analyte so no further action is required.



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10428032
 Project Manager: Jennifer Anderson

FL-TT-07 (10428032004)

A181704-01 (Water)

Date Sampled
04/19/2018 18:03

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804193

Acetochlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	LC
Metolachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 22:41	EPA 8270D	
Surrogate: Atrazine-d5		79.4 %		65.1-122	04/25/2018	04/27/2018 22:41	EPA 8270D	
Surrogate: Parathion-d10		110 %		22.3-159	04/25/2018	04/27/2018 22:41	EPA 8270D	
Surrogate: Triphenyl phosphate		93.6 %		65.2-151	04/25/2018	04/27/2018 22:41	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804196

2,4-D	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/26/2018	05/02/2018 06:58	EPA 8151A	
Surrogate: 2,4-D-d5		93.8 %		44.2-121	04/26/2018	05/02/2018 06:58	EPA 8151A	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

FL-TT-03 (10428032001)

A181704-02 (Water)

Date Sampled
04/19/2018 09:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804193

Acetochlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	LC
Metolachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:14	EPA 8270D	
Surrogate: Atrazine-d5		86.2 %		65.1-122	04/25/2018	04/27/2018 23:14	EPA 8270D	
Surrogate: Parathion-d10		132 %		22.3-159	04/25/2018	04/27/2018 23:14	EPA 8270D	
Surrogate: Triphenyl phosphate		108 %		65.2-151	04/25/2018	04/27/2018 23:14	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804196

2,4-D	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/26/2018	05/02/2018 07:33	EPA 8151A	
Surrogate: 2,4-D-d5		85.0 %		44.2-121	04/26/2018	05/02/2018 07:33	EPA 8151A	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

FL-TT-04 (10428032002)

A181704-03 (Water)

Date Sampled
04/19/2018 13:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804193

Acetochlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	LC
Metolachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/25/2018	04/27/2018 23:47	EPA 8270D	
Surrogate: Atrazine-d5		77.4 %		65.1-122	04/25/2018	04/27/2018 23:47	EPA 8270D	
Surrogate: Parathion-d10		126 %		22.3-159	04/25/2018	04/27/2018 23:47	EPA 8270D	
Surrogate: Triphenyl phosphate		104 %		65.2-151	04/25/2018	04/27/2018 23:47	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804196

2,4-D	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	LC
2,4,5-T	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/26/2018	05/02/2018 09:55	EPA 8151A	
Surrogate: 2,4-D-d5		84.9 %		44.2-121	04/26/2018	05/02/2018 09:55	EPA 8151A	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10428032
 Project Manager: Jennifer Anderson

FL-TT-05 (10428032003)

Date Sampled
 04/19/2018 15:45

A181704-04 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804193

Acetochlor	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	LC
Metolachlor	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	LC
Propachlor	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/25/2018	04/28/2018 00:20	EPA 8270D	
Surrogate: Atrazine-d5		76.0 %		65.1-122	04/25/2018	04/28/2018 00:20	EPA 8270D	
Surrogate: Parathion-d10		139 %		22.3-159	04/25/2018	04/28/2018 00:20	EPA 8270D	
Surrogate: Triphenyl phosphate		101 %		65.2-151	04/25/2018	04/28/2018 00:20	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A804196

2,4-D	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	LC
2,4,5-T	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/26/2018	05/02/2018 10:31	EPA 8151A	
Surrogate: 2,4-D-d5		94.4 %		44.2-121	04/26/2018	05/02/2018 10:31	EPA 8151A	



2525 Advance Road
 Madison, WI 53718
 608.221.8700 Phone
 608.221.4889 Fax

Pace Analytical
 1700 Elm Street, Suite 200
 Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
 Project Number: 10428032
 Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804193 - EPA 3510C

Blank (A804193-BLK1)

Prepared: 04/25/2018 Analyzed: 04/27/2018 00:21

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>69.9</i>	<i>65.1-122</i>			
<i>Surrogate: Parathion-d10</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>98.8</i>	<i>22.3-159</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>ND</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.8</i>	<i>65.2-151</i>			

LCS (A804193-BS1)

Prepared: 04/25/2018 Analyzed: 04/27/2018 00:53

Acetochlor	0.764	0.50	ug/L	1.000		76.4	67.5-120			
Alachlor	0.833	0.50	ug/L	1.000		83.3	71.7-120			
Atrazine	0.759	0.50	ug/L	1.000		75.9	72.8-113			
Chlorpyrifos	0.747	0.50	ug/L	1.000		74.7	65.3-119			
Cyanazine	0.791	0.20	ug/L	1.000		79.1	49.5-140			
Desethylatrazine	0.774	0.50	ug/L	1.000		77.4	66.9-116			
Deisopropylatrazine	0.625	0.50	ug/L	1.000		62.5	44.3-110			
Dimethenamid	0.805	0.50	ug/L	1.000		80.5	63.8-116			
EPTC	0.706	0.50	ug/L	1.000		70.6	41.7-102			
Ethalfuralin	0.886	0.50	ug/L	1.000		88.6	41-127			
Fonofos	0.804	0.50	ug/L	1.000		80.4	59.7-118			
Metolachlor	0.791	0.50	ug/L	1.000		79.1	71.7-122			
Metribuzin	0.824	0.50	ug/L	1.000		82.4	66.6-128			
Pendimethalin	0.866	0.50	ug/L	1.000		86.6	55.5-137			
Phorate	0.683	0.30	ug/L	1.000		68.3	41.2-114			
Prometon	0.799	0.50	ug/L	1.000		79.9	66.3-120			
Propachlor	0.813	0.50	ug/L	1.000		81.3	65.8-119			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804193 - EPA 3510C

LCS (A804193-BS1)

Prepared: 04/25/2018 Analyzed: 04/27/2018 00:53

Propazine	0.759	0.50	ug/L	1.000		75.9	72-122			
Simazine	0.776	0.50	ug/L	1.000		77.6	72.8-113			
Terbufos	0.719	0.20	ug/L	1.000		71.9	38.6-115			
Triallate	0.900	0.50	ug/L	1.000		90.0	51.4-116			
Trifluralin	0.809	0.50	ug/L	1.000		80.9	46.1-134			
Surrogate: Atrazine-d5	0.378		ug/L	0.5000		75.6	65.1-122			
Surrogate: Parathion-d10	0.588		ug/L	0.5000		118	22.3-159			
Surrogate: Triphenyl phosphate	0.426		ug/L	0.5000		85.3	65.2-151			

LCS Dup (A804193-BSD1)

Prepared: 04/25/2018 Analyzed: 04/27/2018 01:26

Acetochlor	0.801	0.50	ug/L	1.000		80.1	67.5-120	4.76	20	
Alachlor	0.854	0.50	ug/L	1.000		85.4	71.7-120	2.45	20	
Atrazine	0.806	0.50	ug/L	1.000		80.6	72.8-113	6.00	20	
Chlorpyrifos	0.828	0.50	ug/L	1.000		82.8	65.3-119	10.4	20	
Cyanazine	0.754	0.20	ug/L	1.000		75.4	49.5-140	4.82	20	
Desethylatrazine	0.786	0.50	ug/L	1.000		78.6	66.9-116	1.53	20	
Deisopropylatrazine	0.679	0.50	ug/L	1.000		67.9	44.3-110	8.34	20	
Dimethenamid	0.822	0.50	ug/L	1.000		82.2	63.8-116	2.06	20	
EPTC	0.719	0.50	ug/L	1.000		71.9	41.7-102	1.79	20	
Ethalfuralin	0.837	0.50	ug/L	1.000		83.7	41-127	5.66	20	
Fonofos	0.827	0.50	ug/L	1.000		82.7	59.7-118	2.74	20	
Metolachlor	0.850	0.50	ug/L	1.000		85.0	71.7-122	7.16	20	
Metribuzin	0.840	0.50	ug/L	1.000		84.0	66.6-128	1.91	20	
Pendimethalin	0.922	0.50	ug/L	1.000		92.2	55.5-137	6.31	20	
Phorate	0.725	0.30	ug/L	1.000		72.5	41.2-114	6.00	20	
Prometon	0.857	0.50	ug/L	1.000		85.7	66.3-120	7.09	20	
Propachlor	0.808	0.50	ug/L	1.000		80.8	65.8-119	0.636	20	
Propazine	0.842	0.50	ug/L	1.000		84.2	72-122	10.3	20	
Simazine	0.801	0.50	ug/L	1.000		80.1	72.8-113	3.19	20	
Terbufos	0.731	0.20	ug/L	1.000		73.1	38.6-115	1.61	20	
Triallate	0.911	0.50	ug/L	1.000		91.1	51.4-116	1.32	20	
Trifluralin	0.844	0.50	ug/L	1.000		84.4	46.1-134	4.29	20	
Surrogate: Atrazine-d5	0.362		ug/L	0.5000		72.3	65.1-122			
Surrogate: Parathion-d10	0.528		ug/L	0.5000		106	22.3-159			
Surrogate: Triphenyl phosphate	0.416		ug/L	0.5000		83.1	65.2-151			



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control
Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A804196 - EPA 3510C

Blank (A804196-BLK1)

Prepared: 04/26/2018 Analyzed: 05/02/2018 02:12

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							

Surrogate: 2,4-D-d5

1.72 ug/L 2.016 85.2 44.2-121

LCS (A804196-BS1)

Prepared: 04/26/2018 Analyzed: 05/02/2018 04:35

2,4-D	1.85	0.50	ug/L	2.000		92.3	64.6-148			
2,4-DB	1.48	0.50	ug/L	2.000		73.8	66.7-143			
2,4,5-T	1.61	0.50	ug/L	2.000		80.4	63.4-133			
2,4,5-TP (Silvex)	1.66	0.50	ug/L	2.000		83.0	63-145			
Bentazon	0.819	0.50	ug/L	1.000		81.9	52.5-139			
Dicamba	1.70	0.50	ug/L	2.000		84.9	55.4-143			
MCPA	1.64	0.30	ug/L	2.000		82.2	33.5-143			
Picloram	0.642	0.50	ug/L	1.000		64.2	47.9-113			
Triclopyr	1.67	0.50	ug/L	2.000		83.6	65.1-141			

Surrogate: 2,4-D-d5

1.79 ug/L 2.016 88.6 44.2-121

LCS Dup (A804196-BSD1)

Prepared: 04/26/2018 Analyzed: 05/02/2018 05:11

2,4-D	1.99	0.50	ug/L	2.000		99.5	64.6-148	7.54	20	
2,4-DB	1.73	0.50	ug/L	2.000		86.5	66.7-143	15.9	20	
2,4,5-T	1.81	0.50	ug/L	2.000		90.5	63.4-133	11.9	20	
2,4,5-TP (Silvex)	1.84	0.50	ug/L	2.000		92.2	63-145	10.6	20	
Bentazon	0.939	0.50	ug/L	1.000		93.9	52.5-139	13.6	20	
Dicamba	1.92	0.50	ug/L	2.000		96.2	55.4-143	12.5	20	
MCPA	1.89	0.30	ug/L	2.000		94.5	33.5-143	13.8	20	
Picloram	0.729	0.50	ug/L	1.000		72.9	47.9-113	12.8	20	
Triclopyr	1.93	0.50	ug/L	2.000		96.7	65.1-141	14.6	20	

Surrogate: 2,4-D-d5

1.92 ug/L 2.016 95.3 44.2-121



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
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Minneapolis MN, 55414

Project: 18-00383 MPCA Freeway LF Water - MN
Project Number: 10428032
Project Manager: Jennifer Anderson

Notes and Definitions

- LC Results may be biased low because of low continuing calibration verification (CCV).
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

A181704

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428032 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/4/2018

Report To	Subcontract To	Requested Analysis														LAB USE ONLY								
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451	Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700	Herbicides MDA List II EPA 8151	Pesticides MDA List I (8270 pest)																					
Preserved Containers																								
Item	Sample ID			Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved																
1	FL-TT-03			PS	4/19/2018 09:30	10428032001	Water	2							X	X								NOT IN COOLER
2	FL-TT-04			PS	4/19/2018 13:00	10428032002	Water	2							X	X								↓
3	FL-TT-05			PS	4/19/2018 15:45	10428032003	Water	2							X	X								
4	FL-TT-07			PS	4/19/2018 18:03	10428032004	Water	2							X	X								01
5																								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/23/18	<i>[Signature]</i>		
2					
3					

Cooler Temperature on Receipt 3.1 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact Y or (N)

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

160147274 exp 7/12/18

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

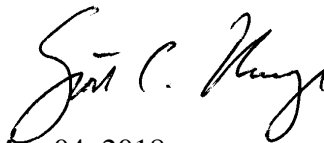
PaceProject#: 10428044
Sample Receipt Date: 04/20/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 04, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 4, 2018

DISCUSSION

This report presents the results from the analyses performed on four samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report.

The recoveries of the isotopically-labeled TCDD internal standard in the sample extracts ranged from 53-76%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 116-125% with a relative percent difference of 7.5%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

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Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE)	MN002
Arkansas	88-0680	New York (NEL)	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Report No.....10426745

Appendix A

Sample Management

WO#: 10428044



10428044

Report No.....10428044_1613TCDD_DFR

body Form	Work Order Number:	COC Type:	Page: 1 of 1
	Turnaround Time:	COC ID:	

CLIENT INFO		LABORATORY	
Facility Code: MNSW057 / MPCA Freeway LF Waters	Program Code (MDH Lab Only):	Lab Name:	
Project Name: MPCA Freeway LF Waters	Project Task Code:	Address: 18-00383	
Project Manager: Jennifer Anderson (Paw)		EPIC Profile #38716	
Potential Hazard?	If yes, add information to Sampler Comments Section	Phone No:	

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED						
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES			PRESERV.	ANALYSIS	List A	List B	List C	Lab Sample No.	#
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)							
FL-TT-03	S	4/19/18	0930			G	NW	Wtr-Ground			41	X	X	X	001	1	
FL-TT-04	S	4/19/18	1300			G	NW	Wtr-Ground			37	X	X	X	002	2	
FL-TT-05	S	4/19/18	1545			G	NW	Wtr-Ground			41	X	X	X	003	3	
FL-TT-07	S	4/19/18	1830			G	NW	Wtr-Ground			38	X	X	X	004	4	
																5	
																6	
																7	
																8	
																9	
																10	

Sampled By: Brad Jacobson / SWK / TSB Sampler's Signature: *Brad Jacobson* Phone #: 612-590-8224

Receiving Comments:	
Relinquished By/Affiliation	Date/Time
Accepted By/Affiliation	Date/Time
(Sampler)	4-20-18/830
	W. Pace 4-20-18 830

T_s 2.6, 3.0, 2.0, 2.5, 3.9, 3.6, 2.7, 4.0 °C

Page 5 of 16

Sample Condition Upon Receipt	Client Name: <u>FSD / MPCA</u>	Project #: WO#: 10428044	
Courier:	<input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input checked="" type="checkbox"/> Client <input type="checkbox"/> Commercial <input type="checkbox"/> Pace <input type="checkbox"/> SpeedDee <input type="checkbox"/> Other: _____	PM: SCU Due Date: 05/04/18	CLIENT: PASI-MNFLD
Tracking Number: _____			

Custody Seal on Cooler/Box Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Seals Intact? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Optional: Proj. Due Date: _____ Proj. Name: _____
Packing Material: <input type="checkbox"/> Bubble Wrap <input checked="" type="checkbox"/> Bubble Bags <input type="checkbox"/> None <input type="checkbox"/> Other: _____	Temp Blank? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Thermometer Used: <input type="checkbox"/> 151401163 <input checked="" type="checkbox"/> G87A9155100842	Type of Ice: <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Blue <input type="checkbox"/> None <input type="checkbox"/> Dry <input type="checkbox"/> Melted	
Cooler Temp Read (°C): <u>2.6, 1.3, 0.2, 2.0, 2.5, 4.0</u>	Cooler Temp Corrected (°C): <u>2.0, 3.0, 2.0, 2.5</u>	Biological Tissue Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Temp should be above freezing to 6°C	Correction Factor: <u>True</u>	Date and Initials of Person Examining Contents: <u>ME 4/20/18</u>
USDA Regulated Soil (<input checked="" type="checkbox"/> N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? <input type="checkbox"/> Yes <input type="checkbox"/> No		

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
HeadSpace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION	Field Data Required? <input type="checkbox"/> Yes <input type="checkbox"/> No
Person Contacted: _____	Date/Time: _____
Comments/Resolution: _____	

Project Manager Review: [Signature] Date: 04/20/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Report No.....10426745

Report No.....10428044_1613TCDD_DFR

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Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-03		
Lab Sample ID	10428044001		
Filename	U180503B_12		
Injected By	SMT		
Total Amount Extracted	935 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/19/2018 09:30
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503A_13	Extracted	04/24/2018 11:20
Method Blank ID	BLANK-61923	Analyzed	05/04/2018 01:00

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	60
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-04		
Lab Sample ID	10428044002		
Filename	U180503B_13		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/19/2018 13:00
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503A_13	Extracted	04/24/2018 11:20
Method Blank ID	BLANK-61923	Analyzed	05/04/2018 01:48

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	53
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	88

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-05		
Lab Sample ID	10428044003		
Filename	U180503B_14		
Injected By	SMT		
Total Amount Extracted	998 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/19/2018 15:45
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503A_13	Extracted	04/24/2018 11:20
Method Blank ID	BLANK-61923	Analyzed	05/04/2018 02:36

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	76
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	90

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-07		
Lab Sample ID	10428044004		
Filename	U180503B_15		
Injected By	SMT		
Total Amount Extracted	1000 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/19/2018 18:30
ICAL ID	U180405	Received	04/20/2018 08:30
CCal Filename(s)	U180503A_13	Extracted	04/24/2018 11:20
Method Blank ID	BLANK-61923	Analyzed	05/04/2018 03:23

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	55
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	58

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61923	Matrix	Water
Filename	U180502B_08	Dilution	NA
Total Amount Extracted	1020 mL	Extracted	04/24/2018 11:20
ICAL ID	U180405	Analyzed	05/02/2018 21:50
CCal Filename(s)	U180502A_10	Injected By	SMT

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	71
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	73

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

R = Recovery outside target range

E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61924	Matrix	Water
Filename	U180502B_06	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/24/2018 11:20
ICAL ID	U180405	Analyzed	05/02/2018 20:14
CCal Filename	U180502A_10	Injected By	SMT
Method Blank ID	BLANK-61923		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	12	7.3	14.6	125
2,3,7,8-TCDD-37Cl4	10	8.4	3.7	15.8	84
2,3,7,8-TCDD-13C	100	75	25.0	141.0	75

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61925	Matrix	Water
Filename	U180502B_07	Dilution	NA
Total Amount Extracted	1030 mL	Extracted	04/24/2018 11:20
ICAL ID	U180405	Analyzed	05/02/2018 21:02
CCal Filename	U180502A_10	Injected By	SMT
Method Blank ID	BLANK-61923		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	12	7.3	14.6	116
2,3,7,8-TCDD-37Cl4	10	9.0	3.7	15.8	90
2,3,7,8-TCDD-13C	100	75	25.0	141.0	75

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61924
Spike 1 Filename U180502B_06

Spike 2 ID LCSD-61925
Spike 2 Filename U180502B_07

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	125	116	7.5

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 07, 2018

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6451
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

Grand Rapids Certification ID's

5560 Corporate Exchange Ct SE, Grand Rapids, MI 49512

Minnesota Department of Health, Certificate #1385941

Arkansas Department of Environmental Quality, Certificate #17-046-0

Georgia Environmental Protection Division, Stipulation

Illinois Environmental Protection Agency, Certificate

#004325

Michigan Department of Environmental Quality, Laboratory

#0034

New York State Department of Health, Serial #56192 and 56193

North Carolina Division of Water Resources, Certificate #659

Virginia Department of General Services, Certificate #9028

Wisconsin Department of Natural Resources, Laboratory #999472650

U.S. Department of Agriculture Permit to Receive Soil, Permit #P330-17-00278

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10428166001	FL-TT-08	Water	04/20/18 15:00	04/20/18 17:30
10428166002	FL-TT-08Dup	Water	04/20/18 15:25	04/20/18 17:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory	
10428166001	FL-TT-08	EPA 8081B	XV1	24	PASI-M	
		EPA 8082A	RAG	11	PASI-M	
		EPA 200.7	DM	8	PASI-M	
		EPA 200.8	RJS	2	PASI-M	
		EPA 200.8	TT3	12	PASI-M	
		EPA 245.1	LMW	1	PASI-M	
		EPA 8270D	AT1	38	PASI-M	
			CLJ	2	PASI-V	
			Hach 10360 Rev 1.1	AJS	1	PASI-M
			EPA 1664A OG	AR3	1	PASI-M
			EPA 180.1	JFP	1	PASI-M
			SM 2540D	NAS	1	PASI-M
			SM 4500-H+B	KEO	1	PASI-M
			Trivalent Chromium Calculation	KEO	1	PASI-M
			EPA 300.0	KEO	1	PASI-M
			SM 3500-Cr B Modified	JFP	1	PASI-M
			EPA 350.1	CLJ	1	PASI-V
			EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
			EPA 353.2	JFP	3	PASI-M
			EPA 9016	AMM	1	PASI-GRMI
		10428166002	FL-TT-08Dup	SM 4500-CN-E	DCL	1
SM 4500-P E	DCL			1	PASI-M	
EPA 8081B	XV1			24	PASI-M	
EPA 8082A	RAG			11	PASI-M	
EPA 200.7	DM			8	PASI-M	
EPA 200.8	RJS			2	PASI-M	
EPA 200.8	TT3			12	PASI-M	
EPA 245.1	LMW			1	PASI-M	
EPA 8270D	AT1			38	PASI-M	
	CLJ			2	PASI-V	
	Hach 10360 Rev 1.1			AJS	1	PASI-M
	EPA 1664A OG			AR3	1	PASI-M
	EPA 180.1			JFP	1	PASI-M
	SM 2540D			NAS	1	PASI-M
	SM 4500-H+B			KEO	1	PASI-M
	Trivalent Chromium Calculation	KEO	1	PASI-M		
	EPA 300.0	KEO	1	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		EPA 353.2	JFP	3	PASI-M
		EPA 9016	AMM	1	PASI-GRMI
		SM 4500-CN-E	DCL	1	PASI-M
		SM 4500-P E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08		Lab ID: 10428166001	Collected: 04/20/18 15:00	Received: 04/20/18 17:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	6.0	Std. Units	0.10	1		04/20/18 15:00		
Field Temperature	10.5	deg C	0.50	1		04/20/18 15:00		
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	309-00-2	
alpha-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	319-84-6	
beta-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	319-85-7	
delta-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	58-89-9	
Chlordane (Technical)	ND	ug/L	2.6	5	04/24/18 19:41	05/04/18 23:34	57-74-9	
alpha-Chlordane	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	5103-71-9	
gamma-Chlordane	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	5103-74-2	
4,4'-DDD	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	72-54-8	
4,4'-DDE	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	72-55-9	
4,4'-DDT	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	50-29-3	
Dieldrin	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	60-57-1	
Endosulfan I	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	959-98-8	
Endosulfan II	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	1031-07-8	
Endrin	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	72-20-8	
Endrin aldehyde	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	7421-93-4	
Endrin ketone	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:34	53494-70-5	
Heptachlor	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	76-44-8	
Heptachlor epoxide	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:34	1024-57-3	
Methoxychlor	ND	ug/L	2.6	5	04/24/18 19:41	05/04/18 23:34	72-43-5	
Toxaphene	ND	ug/L	7.7	5	04/24/18 19:41	05/04/18 23:34	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	70	%.	62-125	5	04/24/18 19:41	05/04/18 23:34	877-09-8	1M, D3
Decachlorobiphenyl (S)	35	%.	30-143	5	04/24/18 19:41	05/04/18 23:34	2051-24-3	
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11141-16-5	
PCB-1242 (Aroclor 1242)	0.92	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	12672-29-6	
PCB-1254 (Aroclor 1254)	0.19	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:27	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	93	%.	30-125	1	04/24/18 12:23	04/25/18 10:27	877-09-8	
Decachlorobiphenyl (S)	27	%.	30-125	1	04/24/18 12:23	04/25/18 10:27	2051-24-3	S0
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	350	ug/L	200	1	04/23/18 14:49	04/25/18 18:19	7429-90-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08		Lab ID: 10428166001	Collected: 04/20/18 15:00	Received: 04/20/18 17:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Dissolved	303	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:19	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:19	7440-50-8	
Manganese, Dissolved	2290	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:19	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:19	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:19	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:19	7440-31-5	
Zinc, Dissolved	32.3	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:19	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Chromium	64.4	ug/L	10.0	20	04/23/18 10:35	04/25/18 16:05	7440-47-3	
Total Hardness by 2340B	795000	ug/L	2820	20	04/23/18 10:35	04/25/18 16:05		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	0.78	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-36-0	
Arsenic, Dissolved	1.3	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 01:42	7440-41-7	
Boron, Dissolved	352	ug/L	25.0	5	04/23/18 14:28	04/24/18 21:15	7440-42-8	
Cadmium, Dissolved	0.10	ug/L	0.080	1	04/23/18 14:28	04/24/18 01:42	7440-43-9	
Chromium, Dissolved	1.1	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-47-3	
Cobalt, Dissolved	3.2	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-48-4	
Lead, Dissolved	6.2	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:42	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:42	7440-28-0	
Uranium-238, Dissolved	2.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:42	7440-61-1	
Vanadium, Dissolved	1.1	ug/L	1.0	1	04/23/18 14:28	04/24/18 01:42	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:23	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	83-32-9	
Anthracene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	120-12-7	
Benzo(a)pyrene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	50-32-8	
Benzoic acid	ND	ug/L	256	1	04/23/18 14:40	05/03/18 20:34	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	101-55-3	
Butylbenzylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	111-44-4	
2-Chlorophenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	256	1	04/23/18 14:40	05/03/18 20:34	91-94-1	
2,4-Dichlorophenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	120-83-2	
Diethylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	84-66-2	
2,4-Dimethylphenol	ND	ug/L	256	1	04/23/18 14:40	05/03/18 20:34	105-67-9	
Dimethylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	131-11-3	
Di-n-butylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	84-74-2	
2,4-Dinitrophenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	51-28-5	L2
Di-n-octylphthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	117-84-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08		Lab ID: 10428166001	Collected: 04/20/18 15:00	Received: 04/20/18 17:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
bis(2-Ethylhexyl)phthalate	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	117-81-7	
Fluoranthene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	206-44-0	
Fluorene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	86-73-7	
Hexachlorobenzene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	256	1	04/23/18 14:40	05/03/18 20:34	77-47-4	L2
Hexachloroethane	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	67-72-1	
Isophorone	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	78-59-1	
2-Methylnaphthalene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	103	1	04/23/18 14:40	05/03/18 20:34		
N-Nitrosodiphenylamine	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	86-30-6	
Pentachlorophenol	ND	ug/L	103	1	04/23/18 14:40	05/03/18 20:34	87-86-5	
Phenanthrene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	85-01-8	
Phenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	108-95-2	
Pyrene	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	51.3	1	04/23/18 14:40	05/03/18 20:34	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	85	%	60-125	1	04/23/18 14:40	05/03/18 20:34	4165-60-0	P3
2-Fluorobiphenyl (S)	75	%	56-125	1	04/23/18 14:40	05/03/18 20:34	321-60-8	
p-Terphenyl-d14 (S)	71	%	58-125	1	04/23/18 14:40	05/03/18 20:34	1718-51-0	
Phenol-d6 (S)	81	%	58-125	1	04/23/18 14:40	05/03/18 20:34	13127-88-3	
2-Fluorophenol (S)	78	%	55-125	1	04/23/18 14:40	05/03/18 20:34	367-12-4	
2,4,6-Tribromophenol (S)	78	%	65-125	1	04/23/18 14:40	05/03/18 20:34	118-79-6	
Field Data		Analytical Method:						
Field pH	6.0	Std. Units		1		04/20/18 15:00		
Field Temperature	10.5	deg C		1		04/20/18 15:00		
Hach 10360 Rev 1.1 BOD		Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360						
BOD, 5 day	60.2	mg/L	20.0	10	04/20/18 18:08	04/25/18 14:03		B4
1664 HEM, Oil and Grease		Analytical Method: EPA 1664A OG						
Oil and Grease	ND	mg/L	4.8	1		05/07/18 10:00		
180.1 Turbidity		Analytical Method: EPA 180.1						
Turbidity	1460	NTU	15.0	50		04/21/18 12:03		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	2370	mg/L	66.7	1		04/26/18 10:14		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	6.7	Std. Units	0.10	1		04/27/18 12:10		H6
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	0.064	mg/L	0.010	1		05/01/18 16:04		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08		Lab ID: 10428166001		Collected: 04/20/18 15:00	Received: 04/20/18 17:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions		Analytical Method: EPA 300.0						
Fluoride	0.17	mg/L	0.050	1		04/26/18 19:07	16984-48-8	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/21/18 08:42		FS,M1
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 14:18		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	11.1	mg/L	0.20	2	04/30/18 09:45	05/01/18 08:01	7664-41-7	
353.2 Nitrate + Nitrite		Analytical Method: EPA 353.2						
Nitrate as N	0.37	mg/L	0.020	1		04/21/18 08:34	14797-55-8	FS
Nitrite as N	0.046	mg/L	0.020	1		04/21/18 08:34	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.42	mg/L	0.020	1		04/21/18 08:34		FS
9016 Cyanide, Free		Analytical Method: EPA 9016 Preparation Method: EPA 9016						
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 19:58		
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	16.3	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:24	57-12-5	
SM4500P-E, Total Phosphorus		Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B						
Phosphorus	0.41	mg/L	0.10	1	05/03/18 12:33	05/04/18 07:48	7723-14-0	

Sample: FL-TT-08Dup		Lab ID: 10428166002		Collected: 04/20/18 15:25	Received: 04/20/18 17:30	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field pH	6.0	Std. Units	0.10	1		04/20/18 15:25		
Field Temperature	10.5	deg C	0.50	1		04/20/18 15:25		
8081B GCS Pesticides		Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C						
Aldrin	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	309-00-2	
alpha-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	319-84-6	
beta-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	319-85-7	
delta-BHC	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	319-86-8	
gamma-BHC (Lindane)	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	58-89-9	
Chlordane (Technical)	ND	ug/L	2.6	5	04/24/18 19:41	05/04/18 23:53	57-74-9	
alpha-Chlordane	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	5103-71-9	
gamma-Chlordane	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	5103-74-2	
4,4'-DDD	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	72-54-8	
4,4'-DDE	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	72-55-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample:	Lab ID:	Collected:	Received:	Matrix:				
FL-TT-08Dup	10428166002	04/20/18 15:25	04/20/18 17:30	Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8081B GCS Pesticides								
Analytical Method: EPA 8081B Preparation Method: EPA Mod. 3510C								
4,4'-DDT	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	50-29-3	
Dieldrin	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	60-57-1	
Endosulfan I	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	959-98-8	
Endosulfan II	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	33213-65-9	
Endosulfan sulfate	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	1031-07-8	
Endrin	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	72-20-8	
Endrin aldehyde	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	7421-93-4	
Endrin ketone	ND	ug/L	0.52	5	04/24/18 19:41	05/04/18 23:53	53494-70-5	
Heptachlor	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	76-44-8	
Heptachlor epoxide	ND	ug/L	0.26	5	04/24/18 19:41	05/04/18 23:53	1024-57-3	
Methoxychlor	ND	ug/L	2.6	5	04/24/18 19:41	05/04/18 23:53	72-43-5	
Toxaphene	ND	ug/L	7.8	5	04/24/18 19:41	05/04/18 23:53	8001-35-2	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	62-125	5	04/24/18 19:41	05/04/18 23:53	877-09-8	1M, D3
Decachlorobiphenyl (S)	31	%	30-143	5	04/24/18 19:41	05/04/18 23:53	2051-24-3	
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11141-16-5	
PCB-1242 (Aroclor 1242)	1.4	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	12672-29-6	
PCB-1254 (Aroclor 1254)	0.24	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/24/18 12:23	04/25/18 10:42	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	93	%	30-125	1	04/24/18 12:23	04/25/18 10:42	877-09-8	
Decachlorobiphenyl (S)	26	%	30-125	1	04/24/18 12:23	04/25/18 10:42	2051-24-3	SO
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	1100	ug/L	200	1	04/23/18 14:49	04/25/18 18:22	7429-90-5	
Barium, Dissolved	315	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:22	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:22	7440-50-8	
Manganese, Dissolved	2300	ug/L	5.0	1	04/23/18 14:49	04/25/18 18:22	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:22	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/23/18 14:49	04/25/18 18:22	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/23/18 14:49	04/25/18 18:22	7440-31-5	
Zinc, Dissolved	59.5	ug/L	20.0	1	04/23/18 14:49	04/25/18 18:22	7440-66-6	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Chromium	38.3	ug/L	10.0	20	04/23/18 10:35	04/25/18 16:10	7440-47-3	
Total Hardness by 2340B	708000	ug/L	2820	20	04/23/18 10:35	04/25/18 16:10		
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	0.66	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-36-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Sample: FL-TT-08Dup	Lab ID: 10428166002	Collected: 04/20/18 15:25	Received: 04/20/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Arsenic, Dissolved	1.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/23/18 14:28	04/24/18 01:45	7440-41-7	
Boron, Dissolved	336	ug/L	25.0	5	04/23/18 14:28	04/24/18 21:18	7440-42-8	
Cadmium, Dissolved	0.24	ug/L	0.080	1	04/23/18 14:28	04/24/18 01:45	7440-43-9	
Chromium, Dissolved	2.6	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-47-3	
Cobalt, Dissolved	2.8	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-48-4	
Lead, Dissolved	17.5	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:45	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/23/18 14:28	04/24/18 01:45	7440-28-0	
Uranium-238, Dissolved	2.5	ug/L	0.50	1	04/23/18 14:28	04/24/18 01:45	7440-61-1	
Vanadium, Dissolved	2.4	ug/L	1.0	1	04/23/18 14:28	04/24/18 01:45	7440-62-2	
245.1 Mercury, Dissolved		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	04/23/18 13:38	04/23/18 18:25	7439-97-6	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	83-32-9	
Anthracene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	50-32-8	
Benzoic acid	ND	ug/L	51.0	1	04/23/18 14:40	05/03/18 21:03	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	111-44-4	
2-Chlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.0	1	04/23/18 14:40	05/03/18 21:03	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	120-83-2	
Diethylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	84-66-2	
2,4-Dimethylphenol	ND	ug/L	51.0	1	04/23/18 14:40	05/03/18 21:03	105-67-9	
Dimethylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	51-28-5	L2
Di-n-octylphthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	117-81-7	
Fluoranthene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	206-44-0	
Fluorene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	86-73-7	
Hexachlorobenzene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.0	1	04/23/18 14:40	05/03/18 21:03	77-47-4	L2
Hexachloroethane	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	67-72-1	
Isophorone	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.4	1	04/23/18 14:40	05/03/18 21:03		
N-Nitrosodiphenylamine	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	86-30-6	
Pentachlorophenol	ND	ug/L	20.4	1	04/23/18 14:40	05/03/18 21:03	87-86-5	
Phenanthrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	85-01-8	
Phenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	108-95-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Sample: FL-TT-08Dup	Lab ID: 10428166002	Collected: 04/20/18 15:25	Received: 04/20/18 17:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Pyrene	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.2	1	04/23/18 14:40	05/03/18 21:03	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	79	%	60-125	1	04/23/18 14:40	05/03/18 21:03	4165-60-0	
2-Fluorobiphenyl (S)	74	%	56-125	1	04/23/18 14:40	05/03/18 21:03	321-60-8	
p-Terphenyl-d14 (S)	69	%	58-125	1	04/23/18 14:40	05/03/18 21:03	1718-51-0	
Phenol-d6 (S)	79	%	58-125	1	04/23/18 14:40	05/03/18 21:03	13127-88-3	
2-Fluorophenol (S)	76	%	55-125	1	04/23/18 14:40	05/03/18 21:03	367-12-4	
2,4,6-Tribromophenol (S)	86	%	65-125	1	04/23/18 14:40	05/03/18 21:03	118-79-6	
Field Data		Analytical Method:						
Field pH	6.0	Std. Units		1		04/20/18 15:25		
Field Temperature	10.5	deg C		1		04/20/18 15:25		
Hach 10360 Rev 1.1 BOD		Analytical Method: Hach 10360 Rev 1.1 Preparation Method: Hach 10360						
BOD, 5 day	47.7	mg/L	20.0	10	04/20/18 18:08	04/25/18 14:06		B4
1664 HEM, Oil and Grease		Analytical Method: EPA 1664A OG						
Oil and Grease	ND	mg/L	4.9	1		05/07/18 10:00		
180.1 Turbidity		Analytical Method: EPA 180.1						
Turbidity	965	NTU	15.0	50		04/21/18 12:06		
2540D Total Suspended Solids		Analytical Method: SM 2540D						
Total Suspended Solids	1170	mg/L	50.0	1		04/26/18 10:14		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	6.6	Std. Units	0.10	1		04/27/18 12:10		H6
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation						
Chromium, Trivalent	0.038	mg/L	0.010	1		05/01/18 16:04		
300.0 IC Anions		Analytical Method: EPA 300.0						
Fluoride	0.16	mg/L	0.050	1		04/26/18 19:23	16984-48-8	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/21/18 08:42		FS
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		05/02/18 14:27		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	10.6	mg/L	0.20	2	04/30/18 09:45	05/01/18 08:03	7664-41-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sample: FL-TT-08Dup								
Lab ID: 10428166002								
Collected: 04/20/18 15:25 Received: 04/20/18 17:30 Matrix: Water								
353.2 Nitrate + Nitrite Analytical Method: EPA 353.2								
Nitrate as N	0.30	mg/L	0.020	1		04/21/18 08:37	14797-55-8	FS
Nitrite as N	0.043	mg/L	0.020	1		04/21/18 08:37	14797-65-0	FS
Nitrogen, NO2 plus NO3	0.34	mg/L	0.020	1		04/21/18 08:37		FS
9016 Cyanide, Free Analytical Method: EPA 9016 Preparation Method: EPA 9016								
Cyanide, Free	ND	ug/L	5.0	1	04/27/18 18:40	04/27/18 20:07		
SM4500CN-E Cyanide Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	20.5	ug/L	10.0	1	04/26/18 11:59	04/27/18 10:24	57-12-5	
SM4500P-E, Total Phosphorus Analytical Method: SM 4500-P E Preparation Method: SM 4500-P B								
Phosphorus	0.50	mg/L	0.10	1	05/03/18 12:33	05/04/18 07:49	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533449

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury - Dissolved

Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2897827

Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/23/18 17:53	

LABORATORY CONTROL SAMPLE & LCSD: 2897828

2897829

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	4.8	98	96	85-115	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 533435 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2897770 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/25/18 17:32	
Barium, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Copper, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Manganese, Dissolved	ug/L	ND	5.0	04/25/18 17:32	
Nickel, Dissolved	ug/L	ND	20.0	04/25/18 17:32	
Silver, Dissolved	ug/L	ND	10.0	04/25/18 17:32	
Tin, Dissolved	ug/L	ND	75.0	04/25/18 17:32	
Zinc, Dissolved	ug/L	ND	20.0	04/25/18 17:32	

LABORATORY CONTROL SAMPLE: 2897771

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	103	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	986	99	85-115	
Manganese, Dissolved	ug/L	1000	1050	105	85-115	
Nickel, Dissolved	ug/L	1000	1060	106	85-115	
Silver, Dissolved	ug/L	500	503	101	85-115	
Tin, Dissolved	ug/L	1000	1040	104	85-115	
Zinc, Dissolved	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897772 2897773

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10427742001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21200	21400	106	107	70-130	1	30
Barium, Dissolved	ug/L	95.0	1000	1000	1130	1140	104	104	70-130	1	30
Copper, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	70-130	1	30
Manganese, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Nickel, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	70-130	1	30
Silver, Dissolved	ug/L	ND	500	500	509	514	102	103	70-130	1	30
Tin, Dissolved	ug/L	ND	1000	1000	1040	1050	104	105	70-130	1	30
Zinc, Dissolved	ug/L	36.2	1000	1000	1070	1070	103	104	70-130	1	30

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

MATRIX SPIKE SAMPLE: 2898920		10428032004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum, Dissolved	ug/L	358	20000	22100	109	70-130	
Barium, Dissolved	ug/L	607	1000	1630	102	70-130	
Copper, Dissolved	ug/L	ND	1000	1020	102	70-130	
Manganese, Dissolved	ug/L	902	1000	1940	103	70-130	
Nickel, Dissolved	ug/L	ND	1000	1030	102	70-130	
Silver, Dissolved	ug/L	ND	500	515	103	70-130	
Tin, Dissolved	ug/L	ND	1000	1040	104	70-130	
Zinc, Dissolved	ug/L	ND	1000	1030	102	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533691 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898992 Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	0.50	04/24/18 18:12	

LABORATORY CONTROL SAMPLE: 2898993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	100	99.9	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898994 2898995

Parameter	Units	10428058001		2898994		2898995		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chromium	ug/L	0.77	100	100	101	104	100	103	70-130	2	20

MATRIX SPIKE SAMPLE: 2898996

Parameter	Units	10428098002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	<0.50	100	99.4	99	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 533428 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2897737 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Arsenic, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Beryllium, Dissolved	ug/L	ND	0.20	04/25/18 08:49	
Boron, Dissolved	ug/L	ND	5.0	04/25/18 08:49	
Cadmium, Dissolved	ug/L	ND	0.080	04/25/18 08:49	
Chromium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Cobalt, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Lead, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Selenium, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Thallium, Dissolved	ug/L	ND	0.10	04/25/18 08:49	
Uranium-238, Dissolved	ug/L	ND	0.50	04/25/18 08:49	
Vanadium, Dissolved	ug/L	ND	1.0	04/25/18 08:49	

LABORATORY CONTROL SAMPLE: 2897738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.4	99	85-115	
Arsenic, Dissolved	ug/L	100	99.4	99	85-115	
Beryllium, Dissolved	ug/L	100	107	107	85-115	
Boron, Dissolved	ug/L	100	104	104	85-115	
Cadmium, Dissolved	ug/L	100	99.0	99	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	102	102	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	101	101	85-115	
Vanadium, Dissolved	ug/L	100	99.6	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739 2897740

Parameter	Units	10427867001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Antimony, Dissolved	ug/L	0.0029 mg/L	100	110	108	107	105	70-130	2	20		
Arsenic, Dissolved	ug/L	ND	100	112	109	111	109	70-130	2	20		
Beryllium, Dissolved	ug/L	ND	100	107	104	107	104	70-130	3	20		
Boron, Dissolved	ug/L	32.5	100	137	133	104	101	70-130	2	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2897739												2897740	
Parameter	Units	10427867001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Cadmium, Dissolved	ug/L	ND	100	100	102	101	102	101	70-130	2	20		
Chromium, Dissolved	ug/L	ND	100	100	109	107	109	107	70-130	2	20		
Cobalt, Dissolved	ug/L	3.7	100	100	108	106	104	103	70-130	1	20		
Lead, Dissolved	ug/L	ND	100	100	105	103	105	103	70-130	3	20		
Selenium, Dissolved	ug/L	0.00058 mg/L	100	100	114	111	113	110	70-130	2	20		
Thallium, Dissolved	ug/L	ND	100	100	104	100	104	100	70-130	4	20		
Uranium-238, Dissolved	ug/L	10.3	100	100	118	116	108	106	70-130	2	20		
Vanadium, Dissolved	ug/L	ND	100	100	110	108	110	108	70-130	2	20		

MATRIX SPIKE SAMPLE: 2897741									
Parameter	Units	10427767003	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	105	105	70-130			
Arsenic, Dissolved	ug/L	ND	100	106	106	70-130			
Beryllium, Dissolved	ug/L	ND	100	115	115	70-130			
Boron, Dissolved	ug/L	11.5	100	124	113	70-130			
Cadmium, Dissolved	ug/L	ND	100	104	104	70-130			
Chromium, Dissolved	ug/L	ND	100	109	109	70-130			
Cobalt, Dissolved	ug/L	ND	100	110	110	70-130			
Lead, Dissolved	ug/L	ND	100	110	110	70-130			
Selenium, Dissolved	ug/L	ND	100	109	109	70-130			
Thallium, Dissolved	ug/L	ND	100	109	109	70-130			
Uranium-238, Dissolved	ug/L	ND	100	108	108	70-130			
Vanadium, Dissolved	ug/L	ND	100	107	107	70-130			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 534022 Analysis Method: EPA 8081B
QC Batch Method: EPA Mod. 3510C Analysis Description: 8081B GCS Pesticides
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2901130 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
4,4'-DDD	ug/L	ND	0.10	05/04/18 19:36	
4,4'-DDE	ug/L	ND	0.10	05/04/18 19:36	
4,4'-DDT	ug/L	ND	0.10	05/04/18 19:36	
Aldrin	ug/L	ND	0.050	05/04/18 19:36	
alpha-BHC	ug/L	ND	0.050	05/04/18 19:36	
alpha-Chlordane	ug/L	ND	0.050	05/04/18 19:36	
beta-BHC	ug/L	ND	0.050	05/04/18 19:36	
Chlordane (Technical)	ug/L	ND	0.50	05/04/18 19:36	
delta-BHC	ug/L	ND	0.050	05/04/18 19:36	
Dieldrin	ug/L	ND	0.10	05/04/18 19:36	
Endosulfan I	ug/L	ND	0.050	05/04/18 19:36	
Endosulfan II	ug/L	ND	0.10	05/04/18 19:36	
Endosulfan sulfate	ug/L	ND	0.10	05/04/18 19:36	
Endrin	ug/L	ND	0.10	05/04/18 19:36	
Endrin aldehyde	ug/L	ND	0.10	05/04/18 19:36	
Endrin ketone	ug/L	ND	0.10	05/04/18 19:36	
gamma-BHC (Lindane)	ug/L	ND	0.050	05/04/18 19:36	
gamma-Chlordane	ug/L	ND	0.050	05/04/18 19:36	
Heptachlor	ug/L	ND	0.050	05/04/18 19:36	
Heptachlor epoxide	ug/L	ND	0.050	05/04/18 19:36	
Methoxychlor	ug/L	ND	0.50	05/04/18 19:36	
Toxaphene	ug/L	ND	1.5	05/04/18 19:36	
Decachlorobiphenyl (S)	%	69	30-143	05/04/18 19:36	
Tetrachloro-m-xylene (S)	%	89	62-125	05/04/18 19:36	

LABORATORY CONTROL SAMPLE & LCSD: 2901131

Parameter	Units	2901132							RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits				
4,4'-DDD	ug/L	1	1.0	1.0	101	102	67-125	1	20		
4,4'-DDE	ug/L	1	1.0	1.0	100	100	68-125	1	20		
4,4'-DDT	ug/L	1	0.84	0.85	84	85	66-125	1	20		
Aldrin	ug/L	.5	0.46	0.45	91	91	46-125	1	20		
alpha-BHC	ug/L	.5	0.50	0.51	100	101	66-125	1	20		
alpha-Chlordane	ug/L	.5	0.50	0.51	100	101	72-125	1	20		
beta-BHC	ug/L	.5	0.50	0.50	99	100	72-125	1	20		
delta-BHC	ug/L	.5	0.43	0.43	85	86	37-141	1	20		
Dieldrin	ug/L	1	1.1	1.1	108	110	71-125	1	20		
Endosulfan I	ug/L	.5	0.49	0.49	97	99	69-125	2	20		
Endosulfan II	ug/L	1	1.0	1.1	105	107	73-125	2	20		
Endosulfan sulfate	ug/L	1	0.91	0.92	91	92	63-127	1	20		

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Parameter	Units	2901131		2901132			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Endrin	ug/L	1	1.0	1.0	101	102	72-125	1	20	
Endrin aldehyde	ug/L	1	0.98	0.99	98	99	70-125	1	20	
Endrin ketone	ug/L	1	1.0	1.0	103	104	72-127	1	20	
gamma-BHC (Lindane)	ug/L	.5	0.51	0.51	101	102	69-125	1	20	
gamma-Chlordane	ug/L	.5	0.41	0.42	83	84	64-125	1	20	
Heptachlor	ug/L	.5	0.47	0.47	94	94	54-125	0	20	
Heptachlor epoxide	ug/L	.5	0.51	0.52	103	104	72-125	1	20	
Methoxychlor	ug/L	5	4.1	4.1	82	83	67-127	1	20	
Decachlorobiphenyl (S)	%.				67	72	30-143			
Tetrachloro-m-xylene (S)	%.				96	96	62-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 534023 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2901133 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/25/18 09:57	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/25/18 09:57	
Decachlorobiphenyl (S)	%	62	30-125	04/25/18 09:57	
Tetrachloro-m-xylene (S)	%	54	30-125	04/25/18 09:57	

LABORATORY CONTROL SAMPLE & LCSD: 2901134

Parameter	Units	Spike Conc.	2901135		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
			LCS Result	LCSD Result						
PCB-1016 (Aroclor 1016)	ug/L	2	1.3	1.3	67	64	47-125	5	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.5	1.4	73	68	54-125	6	20	
Decachlorobiphenyl (S)	%				63	62	30-125			
Tetrachloro-m-xylene (S)	%				73	58	30-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533843 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2899581 Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dichlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2,4-Dimethylphenol	ug/L	ND	50.0	05/03/18 16:45	
2,4-Dinitrophenol	ug/L	ND	10.0	05/03/18 16:45	
2-Chlorophenol	ug/L	ND	10.0	05/03/18 16:45	
2-Methylnaphthalene	ug/L	ND	10.0	05/03/18 16:45	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	05/03/18 16:45	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	05/03/18 16:45	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	05/03/18 16:45	
4-Bromophenylphenyl ether	ug/L	ND	10.0	05/03/18 16:45	
Acenaphthene	ug/L	ND	10.0	05/03/18 16:45	
Anthracene	ug/L	ND	10.0	05/03/18 16:45	
Benzo(a)pyrene	ug/L	ND	10.0	05/03/18 16:45	
Benzoic acid	ug/L	ND	50.0	05/03/18 16:45	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	05/03/18 16:45	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	05/03/18 16:45	
Butylbenzylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Di-n-butylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Di-n-octylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Diethylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Dimethylphthalate	ug/L	ND	10.0	05/03/18 16:45	
Fluoranthene	ug/L	ND	10.0	05/03/18 16:45	
Fluorene	ug/L	ND	10.0	05/03/18 16:45	
Hexachlorobenzene	ug/L	ND	10.0	05/03/18 16:45	
Hexachlorocyclopentadiene	ug/L	ND	50.0	05/03/18 16:45	
Hexachloroethane	ug/L	ND	10.0	05/03/18 16:45	
Isophorone	ug/L	ND	10.0	05/03/18 16:45	
N-Nitrosodiphenylamine	ug/L	ND	10.0	05/03/18 16:45	
Pentachlorophenol	ug/L	ND	20.0	05/03/18 16:45	
Phenanthrene	ug/L	ND	10.0	05/03/18 16:45	
Phenol	ug/L	ND	10.0	05/03/18 16:45	
Pyrene	ug/L	ND	10.0	05/03/18 16:45	
2,4,6-Tribromophenol (S)	%	89	65-125	05/03/18 16:45	
2-Fluorobiphenyl (S)	%	79	56-125	05/03/18 16:45	
2-Fluorophenol (S)	%	82	55-125	05/03/18 16:45	
Nitrobenzene-d5 (S)	%	86	60-125	05/03/18 16:45	
p-Terphenyl-d14 (S)	%	92	58-125	05/03/18 16:45	
Phenol-d6 (S)	%	85	58-125	05/03/18 16:45	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

LABORATORY CONTROL SAMPLE & LCSD: 2899582			2899583							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	43.7	48.0	87	96	74-125	9	20	
2,4-Dichlorophenol	ug/L	50	42.8	45.4	86	91	68-125	6	20	
2,4-Dimethylphenol	ug/L	50	38.8J	42.1J	78	84	33-125		20	
2,4-Dinitrophenol	ug/L	50	11.9	16.0	24	32	30-127	29	20	L2,R1
2-Chlorophenol	ug/L	50	41.8	45.0	84	90	61-125	7	20	
2-Methylnaphthalene	ug/L	50	42.0	44.9	84	90	67-125	7	20	
2-Methylphenol(o-Cresol)	ug/L	50	41.6	45.2	83	90	63-125	8	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	43.4	45.9	87	92	67-125	6	20	
3,3'-Dichlorobenzidine	ug/L	50	47J	46J	94	92	60-125		20	2M
4-Bromophenylphenyl ether	ug/L	50	43.7	45.7	87	91	75-125	5	20	
Acenaphthene	ug/L	50	42.5	46.5	85	93	74-125	9	20	
Anthracene	ug/L	50	45.0	47.3	90	95	75-125	5	20	
Benzo(a)pyrene	ug/L	50	45.5	48.0	91	96	75-125	5	20	
Benzoic acid	ug/L	50	35.8J	42.7J	72	85	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	42.8	46.3	86	93	55-125	8	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	46.9	48.2	94	96	72-129	3	20	
Butylbenzylphthalate	ug/L	50	46.3	48.6	93	97	69-127	5	20	
Di-n-butylphthalate	ug/L	50	46.3	48.3	93	97	75-125	4	20	
Di-n-octylphthalate	ug/L	50	47.0	48.7	94	97	69-131	4	20	
Diethylphthalate	ug/L	50	45.2	49.6	90	99	75-125	9	20	
Dimethylphthalate	ug/L	50	44.6	49.1	89	98	75-125	10	20	
Fluoranthene	ug/L	50	45.9	48.1	92	96	75-125	5	20	
Fluorene	ug/L	50	45.0	48.1	90	96	75-125	7	20	
Hexachlorobenzene	ug/L	50	44.0	47.3	88	95	74-125	7	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	22	23	30-125		20	L2
Hexachloroethane	ug/L	50	29.1	31.4	58	63	30-125	8	20	
Isophorone	ug/L	50	42.9	45.7	86	91	72-125	6	20	
N-Nitrosodiphenylamine	ug/L	50	45.1	46.5	90	93	75-125	3	20	
Pentachlorophenol	ug/L	50	40.2	43.5	80	87	52-125	8	20	
Phenanthrene	ug/L	50	44.9	47.2	90	94	75-125	5	20	
Phenol	ug/L	50	41.9	45.7	84	91	59-125	9	20	
Pyrene	ug/L	50	45.8	47.8	92	96	75-125	4	20	
2,4,6-Tribromophenol (S)	%				89	97	65-125			
2-Fluorobiphenyl (S)	%				71	78	56-125			
2-Fluorophenol (S)	%				78	85	55-125			
Nitrobenzene-d5 (S)	%				84	88	60-125			
p-Terphenyl-d14 (S)	%				90	93	58-125			
Phenol-d6 (S)	%				82	89	58-125			

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533559

Analysis Method: Hach 10360 Rev 1.1

QC Batch Method: Hach 10360

Analysis Description: Hach 10360 Rev 1.1, BOD

Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898263

Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	04/25/18 13:36	B4

LABORATORY CONTROL SAMPLE: 2898265

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	166	84	85-115	B4

SAMPLE DUPLICATE: 2898266

Parameter	Units	10428032001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	11.2	11.0	3	20	B4

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 536509

Analysis Method: EPA 1664A OG

QC Batch Method: EPA 1664A OG

Analysis Description: 1664 HEM, Oil and Grease

Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2916482

Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	05/07/18 10:00	

LABORATORY CONTROL SAMPLE: 2916483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	37.4	94	78-114	

MATRIX SPIKE SAMPLE: 2916484

Parameter	Units	10429264001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	40	32.4	79	78-114	

SAMPLE DUPLICATE: 2916485

Parameter	Units	10429268001 Result	Dup Result	RPD	Max RPD	Qualifiers
Oil and Grease	mg/L	ND	ND		18	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 533620 Analysis Method: EPA 180.1
QC Batch Method: EPA 180.1 Analysis Description: 180.1 Turbidity
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898779 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.30	04/21/18 11:51	

LABORATORY CONTROL SAMPLE: 2898780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	5.3	5.2	98	90-110	

SAMPLE DUPLICATE: 2898781

Parameter	Units	10428166001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	1460	1590	9	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 534453

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2903621

Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	04/26/18 10:14	

LABORATORY CONTROL SAMPLE: 2903622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	94.0	94	80-120	

SAMPLE DUPLICATE: 2903623

Parameter	Units	10428237001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	66.0	65.0	2	10	

SAMPLE DUPLICATE: 2903624

Parameter	Units	10428237002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	9J		10	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 534746 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 10428166001, 10428166002

LABORATORY CONTROL SAMPLE: 2905107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.1	102	98-102	H6

SAMPLE DUPLICATE: 2905108

Parameter	Units	10428045005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	0	3	H6

SAMPLE DUPLICATE: 2905109

Parameter	Units	10428106007 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.6	6.6	0	3	H6

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 534491 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2903856 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.050	04/26/18 13:21	

LABORATORY CONTROL SAMPLE: 2903857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1	0.98	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903858 2903859

Parameter	Units	10428659008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.64	1	1	1.6	1.6	93	92	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903860 2903861

Parameter	Units	10428686003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.18J	1	1	1.2	1.2	101	98	90-110	2	20	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 533606 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898701 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/21/18 08:41	FS

LABORATORY CONTROL SAMPLE: 2898702

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.21	107	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898703 2898704

Parameter	Units	10428166001		2898703		2898704		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chromium, Hexavalent	mg/L	ND	.2	.2	.0062J	.0057J	1	0	85-115	20	FS,M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 141636 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 560012 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	05/01/18 07:54	

LABORATORY CONTROL SAMPLE: 560013

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 560014 560015

Parameter	Units	12107666003		560014		560015		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Nitrogen, Ammonia	mg/L	0.21	0.21	5	5	ND	0.28	-4	1	90-110	10 M1

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 533605 Analysis Method: EPA 353.2
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
 Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2898697 Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.020	04/21/18 08:38	FS
Nitrite as N	mg/L	ND	0.020	04/21/18 08:38	FS
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	04/21/18 08:38	FS

LABORATORY CONTROL SAMPLE: 2898698

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrite as N	mg/L	1	0.99	99	90-110	FS
Nitrogen, NO2 plus NO3	mg/L	1	0.95	95	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2898699 2898700

Parameter	Units	10428166001		2898699		2898700		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Nitrite as N	mg/L	0.046	1	1	1.0	1.0	97	96	90-110	1	20	FS
Nitrogen, NO2 plus NO3	mg/L	0.42	1	1	1.4	1.4	99	95	90-110	3	20	FS

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

QC Batch: 21467

Analysis Method: EPA 9016

QC Batch Method: EPA 9016

Analysis Description: 9016 Free Cyanide

Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 85665

Matrix: Water

Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide, Free	ug/L	ND	5.0	04/27/18 19:56	

LABORATORY CONTROL SAMPLE: 85666

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide, Free	ug/L	150	154	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 85667

85668

Parameter	Units	10428166001		85667		85668		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Cyanide, Free	ug/L	ND	150	150	154	161	103	107	80-120	4	11

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 534468 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2903673 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	10.0	04/27/18 09:57	

LABORATORY CONTROL SAMPLE: 2903674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	258	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903675 2903676

Parameter	Units	10428172001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	10.1	250	238	250	242	91	93	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2903677 2903678

Parameter	Units	10428174001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	10.6	250	241	250	242	92	92	80-120	0	30	

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QUALITY CONTROL DATA

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

QC Batch: 535812 Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P B Analysis Description: SM4500P-E, Total Phosphorus
Associated Lab Samples: 10428166001, 10428166002

METHOD BLANK: 2912141 Matrix: Water
Associated Lab Samples: 10428166001, 10428166002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.10	05/04/18 07:47	

LABORATORY CONTROL SAMPLE: 2912142

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	1	0.98	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2912143 2912144

Parameter	Units	10429163001		2912143		2912144		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Phosphorus	mg/L	0.34	1	1	1.3	1.4	101	104	80-120	2	30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2912145 2912146

Parameter	Units	10429163002		2912145		2912146		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Phosphorus	mg/L	0.45	1	1	1.4	1.5	99	102	80-120	2	30

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-GRMI Pace Analytical Services - Grand Rapids Michigan
PASI-M Pace Analytical Services - Minneapolis
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10428166
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 533882
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 534200
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 534351
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
Batch: 536509
[BE] Batch extracted by solid phase extraction (SPE).

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QUALIFIERS

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

ANALYTE QUALIFIERS

1M	Sample was yellow in color.
2M	The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
B4	The glucose/glutamic acid standard exceeded the range of 198 plus or minus 30.5 mg/L.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
FS	The sample was filtered in the laboratory prior to analysis.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water
Pace Project No.: 10428166

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428166001	FL-TT-08				
10428166002	FL-TT-08Dup				
10428166001	FL-TT-08	EPA Mod. 3510C	534022	EPA 8081B	534351
10428166002	FL-TT-08Dup	EPA Mod. 3510C	534022	EPA 8081B	534351
10428166001	FL-TT-08	EPA Mod. 3510C	534023	EPA 8082A	534200
10428166002	FL-TT-08Dup	EPA Mod. 3510C	534023	EPA 8082A	534200
10428166001	FL-TT-08	EPA 200.7	533435	EPA 200.7	534229
10428166002	FL-TT-08Dup	EPA 200.7	533435	EPA 200.7	534229
10428166001	FL-TT-08	EPA 200.8	533691	EPA 200.8	533859
10428166002	FL-TT-08Dup	EPA 200.8	533691	EPA 200.8	533859
10428166001	FL-TT-08	EPA 200.8	533428	EPA 200.8	533889
10428166002	FL-TT-08Dup	EPA 200.8	533428	EPA 200.8	533889
10428166001	FL-TT-08	EPA 245.1	533449	EPA 245.1	533882
10428166002	FL-TT-08Dup	EPA 245.1	533449	EPA 245.1	533882
10428166001	FL-TT-08	EPA 3520	533843	EPA 8270D	534330
10428166002	FL-TT-08Dup	EPA 3520	533843	EPA 8270D	534330
10428166001	FL-TT-08				
10428166002	FL-TT-08Dup				
10428166001	FL-TT-08	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428166002	FL-TT-08Dup	Hach 10360	533559	Hach 10360 Rev 1.1	533761
10428166001	FL-TT-08	EPA 1664A OG	536509		
10428166002	FL-TT-08Dup	EPA 1664A OG	536509		
10428166001	FL-TT-08	EPA 180.1	533620		
10428166002	FL-TT-08Dup	EPA 180.1	533620		
10428166001	FL-TT-08	SM 2540D	534453		
10428166002	FL-TT-08Dup	SM 2540D	534453		
10428166001	FL-TT-08	SM 4500-H+B	534746		
10428166002	FL-TT-08Dup	SM 4500-H+B	534746		
10428166001	FL-TT-08	Trivalent Chromium Calculation	535426		
10428166002	FL-TT-08Dup	Trivalent Chromium Calculation	535426		
10428166001	FL-TT-08	EPA 300.0	534491		
10428166002	FL-TT-08Dup	EPA 300.0	534491		
10428166001	FL-TT-08	SM 3500-Cr B Modified	533606		
10428166002	FL-TT-08Dup	SM 3500-Cr B Modified	533606		
10428166001	FL-TT-08	EPA 350.1			
10428166002	FL-TT-08Dup	EPA 350.1			
10428166001	FL-TT-08	EPA 350.1 rev. 2 (1993)	141636	EPA 350.1 rev. 2 (1993)	141774
10428166002	FL-TT-08Dup	EPA 350.1 rev. 2 (1993)	141636	EPA 350.1 rev. 2 (1993)	141774

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 18-00383 MPCA Freeway LF Water

Pace Project No.: 10428166

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10428166001	FL-TT-08	EPA 353.2	533605		
10428166002	FL-TT-08Dup	EPA 353.2	533605		
10428166001	FL-TT-08	EPA 9016	21467	EPA 9016	21631
10428166002	FL-TT-08Dup	EPA 9016	21467	EPA 9016	21631
10428166001	FL-TT-08	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428166002	FL-TT-08Dup	SM 4500-CN-E	534468	SM 4500-CN-E	534565
10428166001	FL-TT-08	SM 4500-P B	535812	SM 4500-P E	535910
10428166002	FL-TT-08Dup	SM 4500-P B	535812	SM 4500-P E	535910

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WO#: 10428166



10428166

Client Form		Work Order Number:	COC Type:	Page: 1 of 3
Client INFO		Turnaround Time:	COC ID:	FOR LAB USE ONLY
Facility Code:	MNSW-057/MPCA Freeway LF	Program Code (MDH Lab Only):	LABORATORY	Lab Work Order Sticker
Project Name:	MPCA Freeway LF Waters	Project Task Code:	Lab Name:	
Project Manager:	Jennifer Anderson (Pace)	Potential Hazard?	Address: 18-00383	
If yes, add information to Sampler Comments Section		Phone No:	EPIC Profile # 38716	

SAMPLE DETAILS										ANALYSIS REQUESTED														
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				PRESERV.	ANALYSIS											
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont		1	2	3	4	5	6	7	8	9	10		
FL-TT-08	S	4/20/18	1500			G	NW	wtr-ground			16	X									001	1		
FL-TT-08 Dup	S	4/20/18	1525			G	NW	wtr-ground			16	X									002	2		
JAK 4/20/18																								

Sampled By: Jack Kokkinen / Zack Eckstrom Sampler's Signature: *[Signature]* Phone #: 612-437-5651

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>[Signature]</i>	4/20/18 1730	<i>[Signature] Pace</i>	4/20/18 1730

T = 6.6°C
7.1°C

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO#: 10428166
 PM: JMA Due Date: 05/07/18
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeedDee Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 151401163 G87A9155100842
 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 6.6, 7.1 Cooler Temp Corrected (°C): 6.6, 7.1 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: None Date and Initials of Person Examining Contents: HF 4-20-18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Colliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2, 3, 7/2, 1/1, 1/1</u>
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/20/2018

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

LABORATORY ANALYTICAL PARAMETER LISTS
LIQUID SAMPLING
 Freeway Landfill and Dump Investigation
 Site Investigation Plan

Parameter List A	Methods
General Parameters	
Biochemical Oxygen Demand (5-day)	HACH 10360
Cyanide, Total	SM 4500CNE
Cyanide, Free	SM 4500C1G
Dissolved Oxygen	Field Parameter
Fluoride	EPA 300.0
Hardness, as CaCO ₃	SM 2340B
Nitrogen, ammonia, as N	EPA 350.1
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc
Oil and Grease	EPA 1664
pH	SM 4500H+B
Phosphorus, total, as P	SM 4500PE
Secchi Disc (Surface Water Only)	Field Parameter
Solids, total suspended	SM 2540D
Turbidity	EPA 180.1
Metals - Dissolved-Field Filtered (1)	
Aluminum, Barium, Copper, Manganese, Nickel, Silver, Tin, Zinc	EPA 200.7
Antimony, Arsenic, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Selenium, Thallium, Uranium, Vanadium	EPA 200.8
Chromium, trivalent	calculated
Chromium, hexavalent	SM3500CRB
Mercury - Dissolved-Field Filtered (1)	EPA 245.1
Dioxins / Furans	
	EPA 1613B
Herbicides / Pesticides	
Organochlorine Pesticides	EPA 8081
SVOCs	
	EPA 8270C
PCBs	
	EPA 8082
PFCs	
	EPA 537
VOCs	
	EPA 8260 LL/SIM
1,4-Dioxane	
	EPA 8270 SIM

- Analysis by MDH Laboratory

** ADD to Parameter List A:

Total Metals: Chromium (for Cr III determination) Ca and Mg (for Total Hardness determination)

Parameter List B	Methods
General Parameters	
Bromate, Chlorite	EPA 300.1
Chlorine dioxide	SM4500ClO2
Chlorine, total residual	Field Parameter
Herbicides / Pesticides	
Herbicides, 10 Compounds	EPA 8151 MDA List II
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)
Diquat	EPA 549.2
VOCs	
DBCP & EDB	EPA 801.1
1,4-Dioxane	EPA 8270 SIM
Acrylamide	EPA 8316 PDFW
Ethylene glycol, Methyl alcohol	EPA 8015 PII
Formaldehyde	EPA 8315 PGRM
Trihalomethanes, total (TTHMMss)	EPA 524.2
Radiochemical	
Gross Alpha (radiation), Gross Beta (radiation)	EPA 900.0
Glyphosate	EPA 547
Haloacetic Acids	
	EPA 552.2

Parameter List C	Methods
General Parameters	
Chloride	EPA 300.00
Herbicides / Pesticides	
Aldicarb, Carbofuran	EPA 8318
Endothall	EPA 548.1
Radiochemical	
Radium 226	EPA 903.1
Radium 228	EPA 904.0
Radium, total	EPA 903.0

Dissolved -Field Filtered(1) Confirmed dissolved metals are requested, not totals, per 3/19/18 email from Mark Umholtz (MPCA).
 BGJ-Pace

WO# : 10428166



10428166

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: N

Workorder: 10428166 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/7/2018

Report To		Subcontract To				Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																			
						Preserved Containers															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4													LAB USE ONLY		
1	FL-TT-08	PS	4/20/2018 15:00	10428166001	Water	1													001		
2	FL-TT-08Dup	PS	4/20/2018 15:25	10428166002	Water	1													002		
3																					
4																					
5																					
															Comments						
Transfers		Released By		Date/Time		Received By		Date/Time													
1		[Signature]		4/23/18 1830		[Signature]		4-24-18 1908													
2		[Signature]		4-24-18 2315		[Signature]		4/25/18 0730													
3		[Signature]		4-25-18 1830		[Signature]		4/25/18 1830													
Cooler Temperature on Receipt				2.2 °C		Custody Seal		M or N		Received on Ice		M or N		Samples Intact						M or N	

returning volume to MPLS

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

T-3.4

Sample Condition Upon Receipt

Client Name: Pace MRI Project #: _____

WO#: 10428166
 PM: JMA Due Date: 05/07/18
 CLIENT: PAST-MINELD

Courier: Fed Ex UPS USPS Client
 Commercial Pace SpeeDee Other: _____
 Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: 151401163 687A9155100842 Type of Ice: Wet Blue None Dry Melted

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: none Date and Initials of Person Examining Contents: ms 4/25/18

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. <u>Return Samples</u>
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>mt</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2</u>
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/26/2018
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

WO#: 12107530



12107530

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Workorder: 10428166 Workorder Name: 18-00383 MPCA Freeway LF Water Owner Received Date: 4/20/2018 Results Requested By: 5/7/2018

Report To		Subcontract To					Requested Analysis																																																																										
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6451		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<table border="1"> <tr><td colspan="10">Preserved Containers</td></tr> <tr><td>H2SO4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										Preserved Containers										H2SO4																																																						
Preserved Containers																																																																																	
H2SO4																																																																																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix						Nitrogen, unionized ammonia, as N					LAB USE ONLY																																																																	
1	FL-TT-08	PS	4/20/2018 15:00	10428166001	Water	1																																																																											
2	FL-TT-08Dup	PS	4/20/2018 15:25	10428166002	Water	1																																																																											
3																																																																																	
4																																																																																	
5																																																																																	

					Comments									
Transfers	Released By	Date/Time	Received By	Date/Time										
1	<i>[Signature]</i>	4/23/18	<i>[Signature]</i>	4/24/18										
2	<i>[Signature]</i>	4/24/18	<i>[Signature]</i>	4/25/18	0730									
3														

Cooler Temperature on Receipt 2.2 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace MN

Project #:

WO#: 12107530
PM: HRZ **Due Date: 05/07/18**
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.4 Biological Tissue Frozen? Yes No NA
Temp should be above freezing to 6°C Correction Factor: ↑0.3 Date and Initials of Person Examining Contents: HRZ 4/24/18 DC

Comments: Bm 4/25/18

Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review:

Angela Loisel

Date: 4/25/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Report Prepared for:

Brad Jacobson
PACE Minnesota Field
1700 Elm Street
Minneapolis MN 55414

**REPORT OF
LABORATORY
ANALYSIS FOR
TCDD**

Report Information:

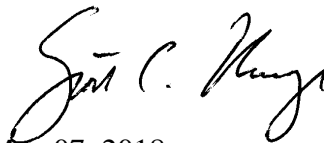
PaceProject#: 10428168
Sample Receipt Date: 04/20/2018
Client Project #: 18-00383
Client Sub PO #: N/A
State Cert #: 027-053-137

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 2,3,7,8-TCDD Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:



May 07, 2018

Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

Report Prepared Date:

May 7, 2018

DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Pace Analytical Services, Inc. The samples were analyzed for the presence or absence of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) using USEPA Method 1613B. The reporting limits were set to correspond to the lowest calibration point and a nominal 1-Liter sample amount, and the sensitivity was verified by signal-to-noise measurements. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in this report. The samples were received above the recommended temperature range of 0-6 degrees Celsius.

The isotopically-labeled TCDD internal standard in the sample extracts was recovered at 68-78%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native TCDD was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of 2,3,7,8-TCDD at the reporting limit.

Laboratory spike samples were also prepared using clean reference matrix that had been fortified with native standard material. The results show that the spiked native TCDD was recovered at 127-128% with a relative percent difference of 0.8%. These results were within the target ranges for the method. Matrix spikes were not prepared with the sample batch.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Report No.....10428232

Appendix A

Sample Management



Port No.: 10428168_1613TCDD_DFR

Custody Form

Work Order Number: _____ COC Type: _____ Page: 1 of 1

Turnaround Time: _____ COC ID: _____

Control Agency	PROJECT/CLIENT INFO	LABORATORY	FOR LAB USE ONLY Lab Work Order Sticker
Facility Code: MNSW-057/MPCA Freeway LF	Program Code (MDH Lab Only):	Lab Name:	
Project Name: MPCA Freeway LF Waters	Project Task Code:	Address: 18-00383	
Project Manager: Jennifer Anderson (Pace)		EPIC Profile # 38716	
Potential Hazard?	If yes, add information to Sampler Comments Section		Phone No:

SAMPLE DETAILS											ANALYSIS REQUESTED				
SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES			PRESERV.	ANALYSIS			
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	# of Cont					
FL-TT-08	S	4/20/18	1500			G	NW	wt-ground		16	X	001	1		
FL-TT-08 Dup	S	4/20/18	1525			G	NW	wt-ground		16	X	002	2		
JAK 4/20/18															

Sampled By: Jack Kollinen / Zack Ekstrom Sampler's Signature: *[Signature]* Phone #: 612-437-5651

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
<i>[Signature]</i>	4/20/18 1730	<i>[Signature] Pace</i>	4/20/18 1730

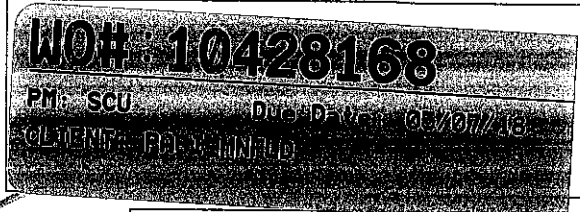
T = 6.6°C
7.1°C

Sample Condition Upon Receipt **Client Name:** MPCA **Project #:** WOH: 10428168

Courier: Fed Ex UPS USPS Client

Commercial Pace SpeedDee Other: _____

Tracking Number: _____



Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Optional:** Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer 151401163 **Type of Ice:** Wet Blue None Dry Melted

Used: G87A9155100842

Cooler Temp Read (°C): 6.6, 7.1 **Cooler Temp Corrected (°C):** 6.6, 7.1 **Biological Tissue Frozen?** Yes No N/A

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** HF 4-20-18

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. <u>NO 4/20/18</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: Received during cool down phase.

Project Manager Review: [Signature] **Date:** 04/23/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc.

Report No.....10428232

Report No.....10428168_1613TCDD_DFR

Page 7 of 14

Appendix B

Sample Analysis Summary



Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-08		
Lab Sample ID	10428168001		
Filename	U180507A_13		
Injected By	BAL		
Total Amount Extracted	501 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/20/2018 15:00
ICAL ID	U180405	Received	04/20/2018 17:30
CCal Filename(s)	U180506B_16	Extracted	04/26/2018 14:00
Method Blank ID	BLANK-61971	Analyzed	05/07/2018 07:18

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	78
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	92

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Sample Analysis Results

Client - PACE Minnesota Field

Client's Sample ID	FL-TT-08Dup		
Lab Sample ID	10428168002		
Filename	U180507A_14		
Injected By	BAL		
Total Amount Extracted	528 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	04/20/2018 15:25
ICAL ID	U180405	Received	04/20/2018 17:30
CCal Filename(s)	U180506B_16	Extracted	04/26/2018 14:00
Method Blank ID	BLANK-61971	Analyzed	05/07/2018 08:06

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	68
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	75

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

ND = Not Detected
 NA = Not Applicable
 NC = Not Calculated

R = Recovery outside target range
 E = Exceeds calibration range

REPORT OF LABORATORY ANALYSIS

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Method 1613B Blank Analysis Results

Lab Sample ID	BLANK-61971	Matrix	Water
Filename	F180501A_06	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	04/26/2018 14:00
ICAL ID	F180405	Analyzed	05/01/2018 20:42
CCal Filename(s)	F180501A_01	Injected By	BAL

Native Isomers	Conc pg/L	EMPC pg/L	RL pg/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDD	ND	----	10	2,3,7,8-TCDD-13C	2.00	74
				Recovery Standard 1,2,3,4-TCDD-13C	2.00	NA
				Cleanup Standard 2,3,7,8-TCDD-37Cl4	0.20	83

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
 EMPC = Estimated Maximum Possible Concentration
 RL = Reporting Limit

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-61972	Matrix	Water
Filename	F180501A_04	Dilution	NA
Total Amount Extracted	1040 mL	Extracted	04/26/2018 14:00
ICAL ID	F180405	Analyzed	05/01/2018 19:12
CCal Filename	F180501A_01	Injected By	BAL
Method Blank ID	BLANK-61971		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	13	7.3	14.6	127
2,3,7,8-TCDD-37Cl4	10	9.6	3.7	15.8	96
2,3,7,8-TCDD-13C	100	82	25.0	141.0	82

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-61973	Matrix	Water
Filename	F180501A_05	Dilution	NA
Total Amount Extracted	1010 mL	Extracted	04/26/2018 14:00
ICAL ID	F180405	Analyzed	05/01/2018 19:57
CCal Filename	F180501A_01	Injected By	BAL
Method Blank ID	BLANK-61971		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDD	10	13	7.3	14.6	128
2,3,7,8-TCDD-37Cl4	10	6.2	3.7	15.8	62
2,3,7,8-TCDD-13C	100	51	25.0	141.0	51

Cs = Concentration Spiked (ng/mL)
 Cr = Concentration Recovered (ng/mL)
 Rec. = Recovery (Expressed as Percent)
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision
 R = Recovery outside of control limits
 Nn = Value obtained from additional analysis
 * = See Discussion

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Method 1613B

Spike Recovery Relative Percent Difference (RPD) Results

Client PACE Minnesota Field

Spike 1 ID LCS-61972
 Spike 1 Filename F180501A_04

Spike 2 ID LCSD-61973
 Spike 2 Filename F180501A_05

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDD	127	128	0.8

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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May 06, 2019

Daniel George
Pace Analytical
1700 Elm Street SE
Minneapolis
MN, 55414
United States

Dear Mr. George

Please find enclosed your radiocarbon (C14) report for the material recently submitted. The result is reported as "% Biogenic Carbon". This indicates the percentage carbon from "renewable" (biomass or animal by-product) sources versus petroleum (or otherwise fossil) sources. For reference, 100 % Biogenic Carbon indicates that a material is entirely sourced from plants or animal by-products and 0 % Biogenic Carbon indicates that a material did not contain any carbon from plants or animal by-products. A value in between represents a mixture of natural and fossil sources.

The analytical measurement is cited as "percent modern carbon (pMC)". This is the percentage of C14 measured in the sample relative to a modern reference standard (NIST 4990C). The % Biogenic Carbon content is calculated from pMC by applying a small adjustment factor for C14 in carbon dioxide in air today. It is important to note is that all internationally recognized standards using C14 assume that the plant or biomass feedstocks were obtained from natural environments.

Reported results are accredited to ISO/IEC 17025:2005 Testing Accreditation PJLA #59423 standards and all chemistry was performed here in our laboratory and counted in our own accelerators in Miami, Florida.

The international standard method utilized for this analysis is cited on your report. The report also indicates if the result is relative to total carbon (TC) or only total organic carbon (TOC). When interpreting the results, please consider any communications you may have had with us regarding the analysis. If you have any questions please contact us. We welcome your inquiries.

Sincerely,



Chris Patrick

Digital signature on file

Chris Patrick Director





Summary of Results - % Biogenic Carbon Content
ASTM D6866-18 Method B (AMS)

Certificate Number: 411332524025100630

Validation:

Chris Patrick
Digital signature on file

Submitter Daniel George
Company Pace Analytical
Date Received April 26, 2019
Date Reported May 06, 2019
Submitter Label FL - Waste 01 (4/2/2019)

RESULT: 59 % Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number Beta-524025
Percent modern carbon (pMC) 58.78 +/- 0.19 pMC
Atmospheric adjustment factor (REF) 100.0; = pMC/1.000



Package received - labeling COC



View of content



4681.2mg analyzed (1mm x 1mm scale)

Disclosures: All work was done at Beta Analytic in its own chemistry lab and AMSs. No subcontractors were used. Beta's chemistry laboratory and AMS do not react or measure artificial C 14 used in biomedical and environmental AMS studies. Beta is a C14 tracer-free facility. Validating quality assurance is verified with a Quality Assurance report posted separately to the web library containing the PDF downloadable copy of this report.

Precision on the RESULT is cited as +/- 3% (absolute). The cited precision on the analytical measure (pMC) is 1 sigma (1 relative standard deviation). The reported result only applies to the analyzed material. The accuracy of the RESULT relies on the measured carbon in the analyzed material having been in recent equilibrium with CO2 in the air and/or from fossil carbon (from living more than 40,000 years ago such as petroleum or coal). The RESULT only applies to relative carbon content, not to relative mass content. The RESULT is calculated by adjusting pMC by the applicable "Atmospheric adjustment factor (REF)" cited in this report.



Summary of Results - % Biogenic Carbon Content
ASTM D6866-18 Method B (AMS)

Certificate Number: 411332524025100630

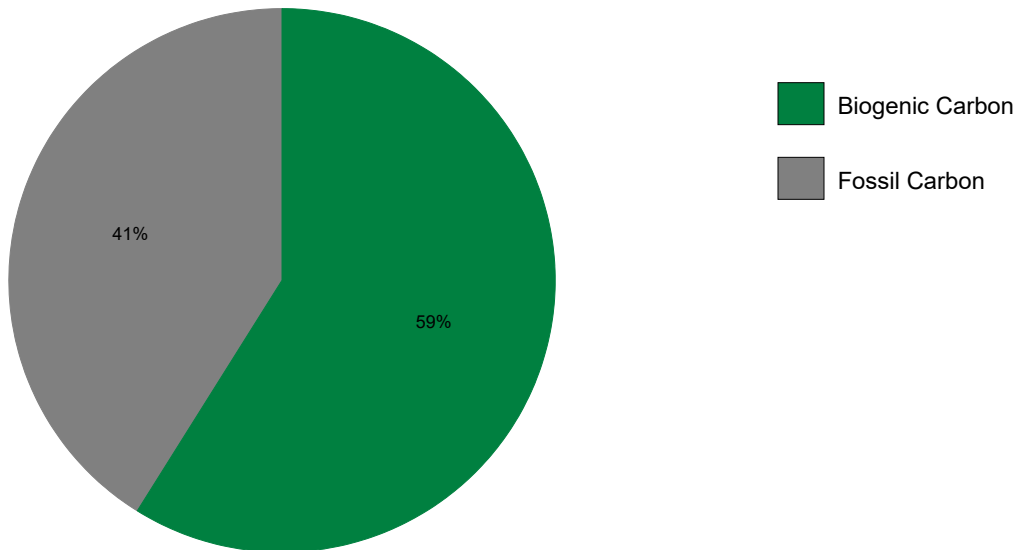
Validation:

Chris Patrick
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Company Pace Analytical
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% Biogenic Carbon Content ASTM D6866-18 Method B (AMS)

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO₂ emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-based). By 2003 there was growing demand for a standardized methodology for applying Carbon-14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

The analytical procedures for measuring radiocarbon content using the different standards are identical. The only difference is the reporting format. Results are usually reported using the standardized terminology “% biobased carbon”. Only ASTM D6866 uses the term “% biogenic carbon” when the result represents all carbon present (Total Carbon) rather than just the organic carbon (Total Organic Carbon). The terms “% biobased carbon” and “% biogenic carbon” are now the standard units in regulatory and industrial applications, replacing obscure units of measure historically reported by radiocarbon dating laboratories e.g. disintegrations per minute per gram (dpm/g) or radiocarbon age.

The result was obtained by measuring the ratio of radiocarbon in the material relative to a National Institute of Standards and Technology (NIST) modern reference standard (SRM 4990C). This ratio was calculated as a percentage and is reported as percent modern carbon (pMC). The value obtained relative to the NIST standard is normalized to the year 1950 AD so an adjustment was required to calculate a carbon source value relative to today. This factor is listed on the report sheet as the terminology “REF”.

Interpretation and application of the results is straightforward. A value of 100% biobased or biogenic carbon would indicate that 100% of the carbon came from plants or animal by-products (biomass) living in the natural environment and a value of 0% would mean that all of the carbon was derived from petrochemicals, coal and other fossil sources. A value between 0-100% would indicate a mixture. The higher the value, the greater the proportion of naturally sourced components in the material.



Quality Assurance Report

This report provides the results of reference materials used to validate radiocarbon analyses prior to reporting. Known-value reference materials were analyzed quasi-simultaneously with the unknowns. Results are reported as expected values vs measured values. Reported values are calculated relative to NIST SRM-4990B and corrected for isotopic fractionation. Results are reported using the direct analytical measure percent modern carbon (pMC) with one relative standard deviation. Agreement between expected and measured values is taken as being within 2 sigma agreement (error x 2) to account for total laboratory error.

Report Date: May 06, 2019
Submitter: Mr. Daniel George

QA MEASUREMENTS

Reference 1

Expected Value: 0.42 +/- 0.04
Measured Value: 0.42 +/- 0.03 pMC
Agreement: Accepted

Reference 2

Expected Value: 129.41 +/- 0.06 pMC
Measured Value: 129.63 +/- 0.39 pMC
Agreement: Accepted

Reference 3

Expected Value: 96.69 +/- 0.50 pMC
Measured Value: 96.42 +/- 0.30 pMC
Agreement: Accepted

COMMENT: All measurements passed acceptance tests.

Validation:


Digital signature on file

Date: May 06, 2019



May 06, 2019

Daniel George
Pace Analytical
1700 Elm Street SE
Minneapolis
MN, 55414
United States

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Sincerely,



Digital signature on file

Chris Patrick Director





Summary of Results - % Biogenic Carbon Content
ASTM D6866-18 Method B (AMS)

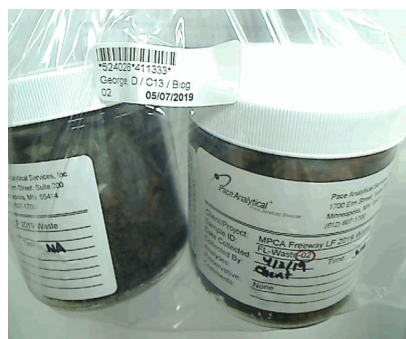
Certificate Number: 411333524026100630

Validation: 
Digital signature on file

Submitter Daniel George
Company Pace Analytical
Date Received April 26, 2019
Date Reported May 06, 2019
Submitter Label FL - Waste 02 (4/2/2019)

RESULT: 61 % Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number Beta-524026
Percent modern carbon (pMC) 61.29 +/- 0.19 pMC
Atmospheric adjustment factor (REF) 100.0; = pMC/1.000



Package received - labeling COC



View of content



4767.8mg analyzed (1mm x 1mm scale)

Disclosures: All work was done at Beta Analytic in its own chemistry lab and AMSs. No subcontractors were used. Beta's chemistry laboratory and AMS do not react or measure artificial C 14 used in biomedical and environmental AMS studies. Beta is a C14 tracer-free facility. Validating quality assurance is verified with a Quality Assurance report posted separately to the web library containing the PDF downloadable copy of this report.

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Summary of Results - % Biogenic Carbon Content
ASTM D6866-18 Method B (AMS)

Certificate Number: 411333524026100630

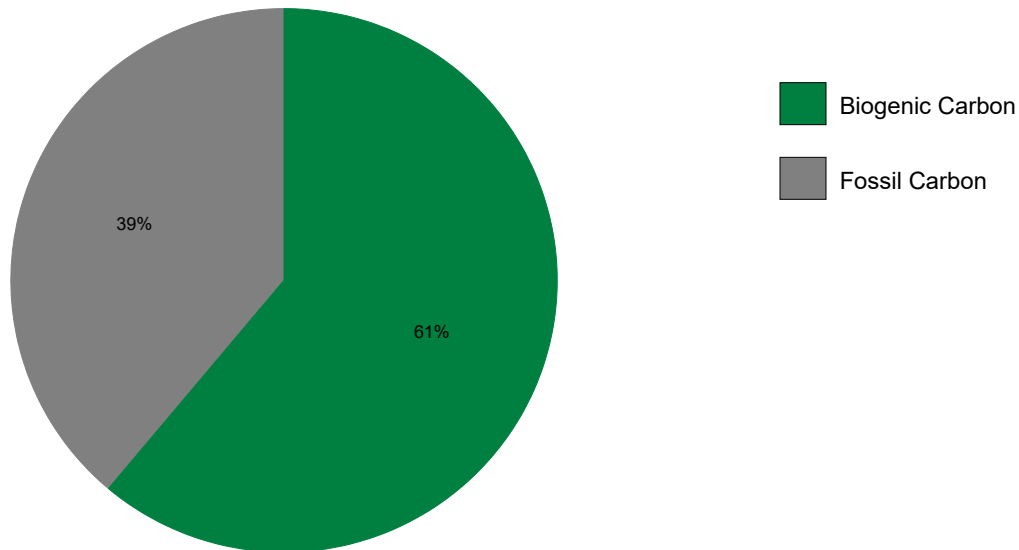
Validation:

Chris Patrick
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Report Date: May 06, 2019
Submitter: Mr. Daniel George

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Agreement: Accepted

COMMENT: All measurements passed acceptance tests.

Validation:


Digital signature on file

Date: May 06, 2019



May 06, 2019

Daniel George
Pace Analytical
1700 Elm Street SE
Minneapolis
MN, 55414
United States

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Sincerely,



Chris Patrick

Digital signature on file

Chris Patrick Director





Summary of Results - % Biogenic Carbon Content
ASTM D6866-18 Method B (AMS)

Certificate Number: 411334524027100630

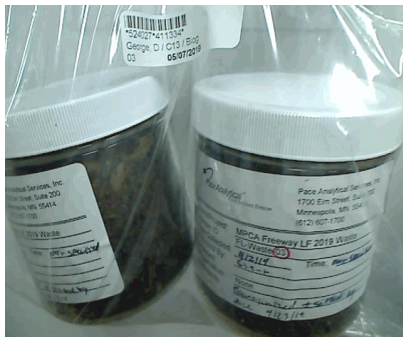
Validation:

Chris Patrick
Digital signature on file

Submitter Daniel George
Company Pace Analytical
Date Received April 26, 2019
Date Reported May 06, 2019
Submitter Label FL - Waste 03 (4/2/2019)

RESULT: 79 % Biogenic Carbon Content (as a fraction of total carbon)

Laboratory Number Beta-524027
Percent modern carbon (pMC) 78.74 +/- 0.2 pMC
Atmospheric adjustment factor (REF) 100.0; = pMC/1.000



Package received - labeling COC



View of content



3825.8mg analyzed (1mm x 1mm scale)

Disclosures: All work was done at Beta Analytic in its own chemistry lab and AMSs. No subcontractors were used. Beta's chemistry laboratory and AMS do not react or measure artificial C 14 used in biomedical and environmental AMS studies. Beta is a C14 tracer-free facility. Validating quality assurance is verified with a Quality Assurance report posted separately to the web library containing the PDF downloadable copy of this report.

Precision on the RESULT is cited as +/- 3% (absolute). The cited precision on the analytical measure (pMC) is 1 sigma (1 relative standard deviation). The reported result only applies to the analyzed material. The accuracy of the RESULT relies on the measured carbon in the analyzed material having been in recent equilibrium with CO2 in the air and/or from fossil carbon (from living more than 40,000 years ago such as petroleum or coal). The RESULT only applies to relative carbon content, not to relative mass content. The RESULT is calculated by adjusting pMC by the applicable "Atmospheric adjustment factor (REF)" cited in this report.



Summary of Results - % Biogenic Carbon Content
ASTM D6866-18 Method B (AMS)

Certificate Number: 411334524027100630

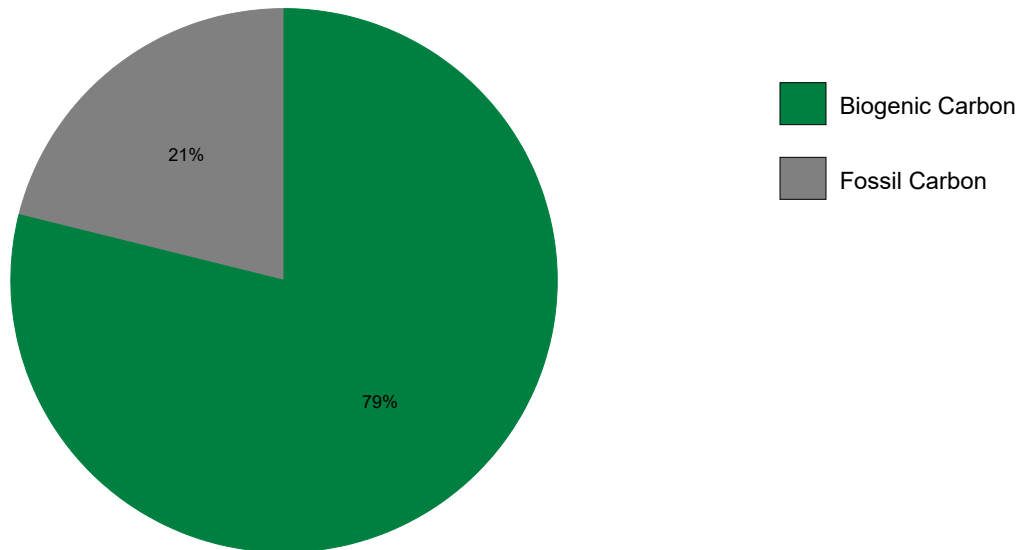
Validation:

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% Biogenic Carbon Content ASTM D6866-18 Method B (AMS)

Explanation of Results

The result was obtained using the radiocarbon isotope (also known as Carbon-14, C14 or 14C), a naturally occurring isotope of carbon that is radioactive and decays in such a way that there is none left after about 45,000 years following the death of a plant or animal. Its most common use is radiocarbon dating by archaeologists. An industrial application was also developed to determine if consumer products and CO₂ emissions were sourced from plants/biomass or from materials such as petroleum or coal (fossil-based). By 2003 there was growing demand for a standardized methodology for applying Carbon-14 testing within the regulatory environment. The first of these standards was ASTM D6866-04, which was written with the assistance of Beta Analytic. Since ASTM was largely viewed as a US standard, European stakeholders soon began demanding an equivalent CEN standard while global stakeholders called for ISO standardization.

The analytical procedures for measuring radiocarbon content using the different standards are identical. The only difference is the reporting format. Results are usually reported using the standardized terminology “% biobased carbon”. Only ASTM D6866 uses the term “% biogenic carbon” when the result represents all carbon present (Total Carbon) rather than just the organic carbon (Total Organic Carbon). The terms “% biobased carbon” and “% biogenic carbon” are now the standard units in regulatory and industrial applications, replacing obscure units of measure historically reported by radiocarbon dating laboratories e.g. disintegrations per minute per gram (dpm/g) or radiocarbon age.

The result was obtained by measuring the ratio of radiocarbon in the material relative to a National Institute of Standards and Technology (NIST) modern reference standard (SRM 4990C). This ratio was calculated as a percentage and is reported as percent modern carbon (pMC). The value obtained relative to the NIST standard is normalized to the year 1950 AD so an adjustment was required to calculate a carbon source value relative to today. This factor is listed on the report sheet as the terminology “REF”.

Interpretation and application of the results is straightforward. A value of 100% biobased or biogenic carbon would indicate that 100% of the carbon came from plants or animal by-products (biomass) living in the natural environment and a value of 0% would mean that all of the carbon was derived from petrochemicals, coal and other fossil sources. A value between 0-100% would indicate a mixture. The higher the value, the greater the proportion of naturally sourced components in the material.



Quality Assurance Report

This report provides the results of reference materials used to validate radiocarbon analyses prior to reporting. Known-value reference materials were analyzed quasi-simultaneously with the unknowns. Results are reported as expected values vs measured values. Reported values are calculated relative to NIST SRM-4990B and corrected for isotopic fractionation. Results are reported using the direct analytical measure percent modern carbon (pMC) with one relative standard deviation. Agreement between expected and measured values is taken as being within 2 sigma agreement (error x 2) to account for total laboratory error.

Report Date: May 06, 2019
Submitter: Mr. Daniel George

QA MEASUREMENTS

Reference 1

Expected Value: 0.42 +/- 0.04
Measured Value: 0.42 +/- 0.03 pMC
Agreement: Accepted

Reference 2

Expected Value: 129.41 +/- 0.06 pMC
Measured Value: 129.63 +/- 0.39 pMC
Agreement: Accepted

Reference 3

Expected Value: 96.69 +/- 0.50 pMC
Measured Value: 96.42 +/- 0.30 pMC
Agreement: Accepted

COMMENT: All measurements passed acceptance tests.

Validation:

Chris Patrick
Digital signature on file

Date: May 06, 2019



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvttl.com



Page: 1 of 3

Sample Number: 19-M789

Report Date: 5/ 8/19

Daniel George
Pace Analytical
1700 Elm St
Minneapolis MN 55414

Work Order #: 81-0357
P.O. #: PRJ07786
Date Collected: 4/ 2/19
Date Received: 4/26/19

Sample Description: FL-Waste-01

ANALYTE	* PROXIMATE *		DRY BASIS	
	AS RECEIVED			
Total Moisture	49.13	wt. %		
Ash	37.10	wt. %	72.93	wt. %
BTU/lb	1265	BTU/lb	2488	BTU/lb
Total Sulfur	0.10	wt. %	0.20	wt. %

ANALYTE	* ULTIMATE *		DRY BASIS	
	AS RECEIVED			
Total Moisture	49.13	wt. %		
Ash	37.10	wt. %	72.93	wt. %
Carbon	9.50	wt. %	18.68	wt. %
Hydrogen	6.65	wt. %	2.27	wt. %
Nitrogen	0.25	wt. %	0.49	wt. %
Total Sulfur	0.10	wt. %	0.20	wt. %
Oxygen by Difference	46.40	wt. %	5.44	wt. %
Chlorine	1270	ug/g	2500	ug/g

ANALYTE	* SULFUR FORMS *		DRY BASIS	
	AS RECEIVED			
Total Sulfur	0.10	wt. %	0.20	wt. %

ANALYTE	* ASH FUSION *	
	REDUCING	OXIDIZING

ANALYTE	* MINERAL ANALYSIS OF ASH *	
	DRY BASIS	

ANALYTE	* MISCELLANEOUS *	
	AS RECEIVED	DRY BASIS
Hydrogen less H2O	1.15	
Oxygen Less H2O	2.77	

Approved by: *Shay Zorndor* *SL*



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 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
 www.mvttl.com



Page: 2 of 3

Sample Number: 19-M790

Report Date: 5/ 8/19

Daniel George
 Pace Analytical
 1700 Elm St
 Minneapolis MN 55414

Work Order #: 81-0357
 P.O. #: PRJ07786
 Date Collected: 4/ 2/19

Date Received: 4/26/19

Sample Description: FL-Waste-02

ANALYTE	* PROXIMATE *		DRY BASIS	
	AS RECEIVED			
Total Moisture	23.65	wt. %		
Ash	64.53	wt. %	84.52	wt. %
BTU/lb	580	BTU/lb	759	BTU/lb
Total Sulfur	0.75	wt. %	0.98	wt. %

ANALYTE	* ULTIMATE *		DRY BASIS	
	AS RECEIVED			
Total Moisture	23.65	wt. %		
Ash	64.53	wt. %	84.52	wt. %
Carbon	4.53	wt. %	5.93	wt. %
Hydrogen	2.82	wt. %	< 0.5	wt. %
Nitrogen	< 0.2	wt. %	< 0.26	wt. %
Total Sulfur	0.75	wt. %	0.98	wt. %
Oxygen by Difference	27.17	wt. %	8.08	wt. %
Chlorine	260	ug/g	341	ug/g

ANALYTE	* SULFUR FORMS *		DRY BASIS	
	AS RECEIVED			
Total Sulfur	0.75	wt. %	0.98	wt. %

ANALYTE	* ASH FUSION *	
	REDUCING	OXIDIZING

ANALYTE	* MINERAL ANALYSIS OF ASH *	
	DRY BASIS	

ANALYTE	* MISCELLANEOUS *	
	AS RECEIVED	DRY BASIS
Hydrogen less H2O	0.17	
Oxygen Less H2O	6.17	

Approved by: Stacy Landon SL



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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www.mvttl.com



Page: 3 of 3

Sample Number: 19-M791

Report Date: 5/ 8/19

Daniel George
Pace Analytical
1700 Elm St
Minneapolis MN 55414

Work Order #: 81-0357
P.O. #: PRJ07786
Date Collected: 4/ 2/19

Date Received: 4/26/19

Sample Description: FL-Waste-03

ANALYTE	* PROXIMATE *		DRY BASIS	
	AS RECEIVED			
Total Moisture	24.07	wt. %		
Ash	63.90	wt. %	84.16	wt. %
BTU/lb	934	BTU/lb	1230	BTU/lb
Total Sulfur	0.28	wt. %	0.37	wt. %

ANALYTE	* ULTIMATE *		DRY BASIS	
	AS RECEIVED			
Total Moisture	24.07	wt. %		
Ash	63.90	wt. %	84.16	wt. %
Carbon	6.24	wt. %	8.22	wt. %
Hydrogen	3.16	wt. %	0.61	wt. %
Nitrogen	< 0.2	wt. %	< 0.26	wt. %
Total Sulfur	0.28	wt. %	0.37	wt. %
Oxygen by Difference	26.22	wt. %	6.38	wt. %
Chlorine	271	ug/g	357	ug/g

ANALYTE	* SULFUR FORMS *		DRY BASIS	
	AS RECEIVED			
Total Sulfur	0.28	wt. %	0.37	wt. %

ANALYTE	* ASH FUSION *	
	REDUCING	OXIDIZING

ANALYTE	* MINERAL ANALYSIS OF ASH *	
		DRY BASIS

ANALYTE	* MISCELLANEOUS *	
	AS RECEIVED	DRY BASIS
Hydrogen less H2O	0.47	
Oxygen Less H2O	4.84	

Approved by: Stacy Zander SL

81-0357



Minnesota Pollution Control Agency

Chain-of-Custody Form revision 2013.0909

Work Order Number:

COC Type:

Page: (of)

Turnaround Time:

COC ID:

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: MNSW-057

Program Code (MDH Lab Only): QW

Lab Name:

MVTL - North Dakota

Project Name: 19-01567 MPCA Freeway LF 2019 Waste

Project Task Code: PRJ07786

Address: 2616 East Broadway Ave.

Project Manager: Brad Jacobson

612-607-6375

Pace MN-FLD: 1700 Elm St., MPLS, MN 55414

Bismark

ND

58501

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 701-258-9720

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wtr-Ground=Groundwater
Wtr-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

PRESERV.

ANALYSIS

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	Chlorine - SW846/50/9251	Sulfur - D4239	CHN+O2 - D5373	Moisture - D3173	Ash @ 750 - D3174	Calorific Value - D5865	Lab Sample No.	#
FL-Waste-01	Sample	4/2/2019	---	---	---	C	SD		N	Bulk waste rec'vd from Barr 4/10/19		X	X	X	X	X	X		1
FL-Waste-02	Sample	4/2/2019	---	---	---	C	SD		N	Bulk waste rec'vd from Barr 4/10/19		X	X	X	X	X	X		2
FL-Waste-03	Sample	4/2/2019	---	---	---	C	SD		N	Bulk waste rec'vd from Barr 4/10/19		X	X	X	X	X	X		3
																			4
																			5
																			6
																			7
																			8
																			9
																			10

4/2/2019
DWS

Sampled By: Barr Engineering Staff

Sampler's Signature:

Not Available - Material received without COC

Phone #:

Receiving Comments:

Relinquished By/Affiliation

Date/Time

Accepted By/ Affiliation

Date/Time

(Sampler)*Pace staff minimizing/reducing material:

Daniel George / Pace

4/2/2019 1150

A. Buchmann MVTL

26 Apr 19 1055

2.32
TMS62

April 11, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10468888

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 29, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137

Minnesota Petrofund Certification #: 1240

Mississippi Certification #: MN00064

Missouri Certification #: 10100

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Primary Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DEP Certification #: 382

West Virginia DW Certification #: 9952 C

Wisconsin Certification #: 999407970

Wyoming UST Certification #: via A2LA 2926.01

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10468888

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10468888001	FD-SB-F2 (0-6ft)	Solid	03/29/19 09:00	03/29/19 14:20
10468888002	FD-SB-G5 (0-6ft)	Solid	03/29/19 09:30	03/29/19 14:20
10468888003	FD-SB-C3 (0-4.5ft)	Solid	03/29/19 09:50	03/29/19 14:20
10468888004	FD-SB-A4 (0-3ft)	Solid	03/29/19 10:15	03/29/19 14:20
10468888005	FD-SB-B1 (0-7.5ft)	Solid	03/29/19 10:40	03/29/19 14:20
10468888006	Trip Blank	Solid	03/29/19 00:00	03/29/19 14:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10468888001	FD-SB-F2 (0-6ft)	WI MOD DRO	JVM	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010D	IP	2	PASI-M		
		EPA 6020B	RJS	5	PASI-M		
		EPA 7471B	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D by SIM	SNG	19	PASI-M		
		EPA 8260B	GDM	70	PASI-M		
		10468888002	FD-SB-G5 (0-6ft)	WI MOD DRO	JVM	2	PASI-M
				WI MOD GRO	AJR	2	PASI-M
EPA 6010D	IP			2	PASI-M		
EPA 6020B	RJS			5	PASI-M		
EPA 7471B	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D by SIM	SNG			19	PASI-M		
EPA 8260B	GDM			70	PASI-M		
10468888003	FD-SB-C3 (0-4.5ft)			WI MOD DRO	JVM	2	PASI-M
				WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M		
		EPA 6020B	RJS	5	PASI-M		
		EPA 7471B	LMW	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D by SIM	SNG	19	PASI-M		
		EPA 8260B	GDM	70	PASI-M		
		10468888004	FD-SB-A4 (0-3ft)	WI MOD DRO	JVM	2	PASI-M
				WI MOD GRO	AJR	2	PASI-M
EPA 6010D	IP			2	PASI-M		
EPA 6020B	RJS			5	PASI-M		
EPA 7471B	LMW			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D by SIM	SNG			19	PASI-M		
EPA 8260B	GDM			70	PASI-M		
10468888005	FD-SB-B1 (0-7.5ft)			WI MOD DRO	JVM	2	PASI-M
				WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M		
		EPA 6020B	RJS	5	PASI-M		
		EPA 7471B	LMW	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
10468888006	Trip Blank	WI MOD GRO	AJR	2	PASI-M
		EPA 8260B	GDM	70	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: FD-SB-F2 (0-6ft) Lab ID: 10468888001 Collected: 03/29/19 09:00 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	135	mg/kg	97.8	25.4	10	04/01/19 08:11	04/02/19 16:23		T6
Surrogates									
n-Triacontane (S)	0	%	50-150		10	04/01/19 08:11	04/02/19 16:23	638-68-6	S4
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	3.1J	mg/kg	11.4	1.5	1	04/09/19 10:22	04/09/19 16:55		
Surrogates									
a,a,a-Trifluorotoluene (S)	97	%	80-150		1	04/09/19 10:22	04/09/19 16:55	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	57.4	mg/kg	0.56	0.047	1	04/01/19 11:50	04/02/19 12:35	7440-39-3	
Silver	<0.041	mg/kg	0.56	0.041	1	04/01/19 11:50	04/02/19 12:35	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	3.6	mg/kg	0.53	0.19	20	04/01/19 11:50	04/05/19 02:29	7440-38-2	
Cadmium	0.11	mg/kg	0.085	0.028	20	04/01/19 11:50	04/05/19 02:29	7440-43-9	
Chromium	18.9	mg/kg	0.53	0.13	20	04/01/19 11:50	04/05/19 02:29	7440-47-3	
Lead	16.7	mg/kg	0.21	0.061	20	04/01/19 11:50	04/05/19 02:29	7439-92-1	
Selenium	0.56	mg/kg	0.53	0.15	20	04/01/19 11:50	04/05/19 02:29	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.030	mg/kg	0.022	0.0090	1	04/01/19 12:10	04/03/19 11:33	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	13.3	%	0.10	0.10	1		04/01/19 11:19		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<2.4	ug/kg	57.7	2.4	5	04/01/19 09:15	04/02/19 21:17	83-32-9	
Acenaphthylene	<2.9	ug/kg	57.7	2.9	5	04/01/19 09:15	04/02/19 21:17	208-96-8	
Anthracene	<2.7	ug/kg	57.7	2.7	5	04/01/19 09:15	04/02/19 21:17	120-12-7	
Benzo(a)anthracene	86.5	ug/kg	57.7	6.2	5	04/01/19 09:15	04/02/19 21:17	56-55-3	
Benzo(a)pyrene	110	ug/kg	57.7	4.0	5	04/01/19 09:15	04/02/19 21:17	50-32-8	
Benzo(b)fluoranthene	144	ug/kg	57.7	2.2	5	04/01/19 09:15	04/02/19 21:17	205-99-2	
Benzo(e)pyrene	102	ug/kg	57.7	4.1	5	04/01/19 09:15	04/02/19 21:17	192-97-2	N2
Benzo(g,h,i)perylene	108	ug/kg	57.7	3.7	5	04/01/19 09:15	04/02/19 21:17	191-24-2	
Benzo(k)fluoranthene	58.7	ug/kg	57.7	4.9	5	04/01/19 09:15	04/02/19 21:17	207-08-9	
Chrysene	119	ug/kg	57.7	7.8	5	04/01/19 09:15	04/02/19 21:17	218-01-9	
Dibenz(a,h)anthracene	<2.7	ug/kg	57.7	2.7	5	04/01/19 09:15	04/02/19 21:17	53-70-3	
Fluoranthene	181	ug/kg	57.7	2.5	5	04/01/19 09:15	04/02/19 21:17	206-44-0	
Fluorene	<1.8	ug/kg	57.7	1.8	5	04/01/19 09:15	04/02/19 21:17	86-73-7	
Indeno(1,2,3-cd)pyrene	71.7	ug/kg	57.7	3.9	5	04/01/19 09:15	04/02/19 21:17	193-39-5	
Naphthalene	<4.4	ug/kg	57.7	4.4	5	04/01/19 09:15	04/02/19 21:17	91-20-3	
Phenanthrene	121	ug/kg	57.7	11.1	5	04/01/19 09:15	04/02/19 21:17	85-01-8	
Pyrene	204	ug/kg	57.7	8.8	5	04/01/19 09:15	04/02/19 21:17	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: FD-SB-F2 (0-6ft) **Lab ID: 10468888001** Collected: 03/29/19 09:00 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Surrogates									
2-Fluorobiphenyl (S)	87	%	30-125		5	04/01/19 09:15	04/02/19 21:17	321-60-8	D3
p-Terphenyl-d14 (S)	74	%	30-125		5	04/01/19 09:15	04/02/19 21:17	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<353	ug/kg	1130	353	1	04/01/19 10:21	04/01/19 14:58	67-64-1	
Allyl chloride	<47.5	ug/kg	227	47.5	1	04/01/19 10:21	04/01/19 14:58	107-05-1	
Benzene	<3.2	ug/kg	22.7	3.2	1	04/01/19 10:21	04/01/19 14:58	71-43-2	
Bromobenzene	<3.5	ug/kg	56.7	3.5	1	04/01/19 10:21	04/01/19 14:58	108-86-1	
Bromochloromethane	<19.6	ug/kg	56.7	19.6	1	04/01/19 10:21	04/01/19 14:58	74-97-5	
Bromodichloromethane	<19.4	ug/kg	56.7	19.4	1	04/01/19 10:21	04/01/19 14:58	75-27-4	
Bromoform	<85.8	ug/kg	227	85.8	1	04/01/19 10:21	04/01/19 14:58	75-25-2	
Bromomethane	<66.3	ug/kg	567	66.3	1	04/01/19 10:21	04/01/19 14:58	74-83-9	
2-Butanone (MEK)	<30.1	ug/kg	283	30.1	1	04/01/19 10:21	04/01/19 14:58	78-93-3	
n-Butylbenzene	<27.0	ug/kg	56.7	27.0	1	04/01/19 10:21	04/01/19 14:58	104-51-8	
sec-Butylbenzene	<10.9	ug/kg	56.7	10.9	1	04/01/19 10:21	04/01/19 14:58	135-98-8	
tert-Butylbenzene	<10.9	ug/kg	56.7	10.9	1	04/01/19 10:21	04/01/19 14:58	98-06-6	
Carbon tetrachloride	<27.1	ug/kg	56.7	27.1	1	04/01/19 10:21	04/01/19 14:58	56-23-5	
Chlorobenzene	<3.2	ug/kg	56.7	3.2	1	04/01/19 10:21	04/01/19 14:58	108-90-7	
Chloroethane	<29.5	ug/kg	567	29.5	1	04/01/19 10:21	04/01/19 14:58	75-00-3	
Chloroform	<28.3	ug/kg	56.7	28.3	1	04/01/19 10:21	04/01/19 14:58	67-66-3	
Chloromethane	<13.6	ug/kg	227	13.6	1	04/01/19 10:21	04/01/19 14:58	74-87-3	
2-Chlorotoluene	<2.8	ug/kg	56.7	2.8	1	04/01/19 10:21	04/01/19 14:58	95-49-8	
4-Chlorotoluene	<2.9	ug/kg	56.7	2.9	1	04/01/19 10:21	04/01/19 14:58	106-43-4	
1,2-Dibromo-3-chloropropane	<197	ug/kg	567	197	1	04/01/19 10:21	04/01/19 14:58	96-12-8	
Dibromochloromethane	<6.6	ug/kg	227	6.6	1	04/01/19 10:21	04/01/19 14:58	124-48-1	
1,2-Dibromoethane (EDB)	<6.0	ug/kg	56.7	6.0	1	04/01/19 10:21	04/01/19 14:58	106-93-4	
Dibromomethane	<10.4	ug/kg	56.7	10.4	1	04/01/19 10:21	04/01/19 14:58	74-95-3	
1,2-Dichlorobenzene	<2.3	ug/kg	56.7	2.3	1	04/01/19 10:21	04/01/19 14:58	95-50-1	
1,3-Dichlorobenzene	<2.1	ug/kg	56.7	2.1	1	04/01/19 10:21	04/01/19 14:58	541-73-1	
1,4-Dichlorobenzene	<3.5	ug/kg	56.7	3.5	1	04/01/19 10:21	04/01/19 14:58	106-46-7	
Dichlorodifluoromethane	<18.4	ug/kg	227	18.4	1	04/01/19 10:21	04/01/19 14:58	75-71-8	
1,1-Dichloroethane	<6.4	ug/kg	56.7	6.4	1	04/01/19 10:21	04/01/19 14:58	75-34-3	
1,2-Dichloroethane	<6.2	ug/kg	56.7	6.2	1	04/01/19 10:21	04/01/19 14:58	107-06-2	
1,1-Dichloroethene	<17.0	ug/kg	56.7	17.0	1	04/01/19 10:21	04/01/19 14:58	75-35-4	
cis-1,2-Dichloroethene	<9.4	ug/kg	56.7	9.4	1	04/01/19 10:21	04/01/19 14:58	156-59-2	
trans-1,2-Dichloroethene	<26.5	ug/kg	56.7	26.5	1	04/01/19 10:21	04/01/19 14:58	156-60-5	
Dichlorofluoromethane	<78.3	ug/kg	567	78.3	1	04/01/19 10:21	04/01/19 14:58	75-43-4	N2
1,2-Dichloropropane	<9.8	ug/kg	56.7	9.8	1	04/01/19 10:21	04/01/19 14:58	78-87-5	
1,3-Dichloropropane	<7.8	ug/kg	56.7	7.8	1	04/01/19 10:21	04/01/19 14:58	142-28-9	
2,2-Dichloropropane	<7.1	ug/kg	227	7.1	1	04/01/19 10:21	04/01/19 14:58	594-20-7	
1,1-Dichloropropene	<26.2	ug/kg	56.7	26.2	1	04/01/19 10:21	04/01/19 14:58	563-58-6	
cis-1,3-Dichloropropene	<8.1	ug/kg	56.7	8.1	1	04/01/19 10:21	04/01/19 14:58	10061-01-5	
trans-1,3-Dichloropropene	<7.9	ug/kg	56.7	7.9	1	04/01/19 10:21	04/01/19 14:58	10061-02-6	
Diethyl ether (Ethyl ether)	<34.7	ug/kg	227	34.7	1	04/01/19 10:21	04/01/19 14:58	60-29-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: FD-SB-F2 (0-6ft) **Lab ID: 10468888001** Collected: 03/29/19 09:00 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Ethylbenzene	<3.1	ug/kg	56.7	3.1	1	04/01/19 10:21	04/01/19 14:58	100-41-4	
Hexachloro-1,3-butadiene	<13.8	ug/kg	283	13.8	1	04/01/19 10:21	04/01/19 14:58	87-68-3	
Isopropylbenzene (Cumene)	<2.5	ug/kg	56.7	2.5	1	04/01/19 10:21	04/01/19 14:58	98-82-8	
p-Isopropyltoluene	<17.2	ug/kg	56.7	17.2	1	04/01/19 10:21	04/01/19 14:58	99-87-6	
Methylene Chloride	<107	ug/kg	227	107	1	04/01/19 10:21	04/01/19 14:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	<11.8	ug/kg	283	11.8	1	04/01/19 10:21	04/01/19 14:58	108-10-1	
Methyl-tert-butyl ether	<6.7	ug/kg	56.7	6.7	1	04/01/19 10:21	04/01/19 14:58	1634-04-4	
Naphthalene	<53.0	ug/kg	227	53.0	1	04/01/19 10:21	04/01/19 14:58	91-20-3	
n-Propylbenzene	<3.0	ug/kg	56.7	3.0	1	04/01/19 10:21	04/01/19 14:58	103-65-1	
Styrene	<2.6	ug/kg	56.7	2.6	1	04/01/19 10:21	04/01/19 14:58	100-42-5	
1,1,1,2-Tetrachloroethane	<17.8	ug/kg	56.7	17.8	1	04/01/19 10:21	04/01/19 14:58	630-20-6	
1,1,2,2-Tetrachloroethane	<10	ug/kg	56.7	10	1	04/01/19 10:21	04/01/19 14:58	79-34-5	
Tetrachloroethene	<19.9	ug/kg	56.7	19.9	1	04/01/19 10:21	04/01/19 14:58	127-18-4	
Tetrahydrofuran	<82.4	ug/kg	2270	82.4	1	04/01/19 10:21	04/01/19 14:58	109-99-9	
Toluene	<13.8	ug/kg	56.7	13.8	1	04/01/19 10:21	04/01/19 14:58	108-88-3	
1,2,3-Trichlorobenzene	<9.1	ug/kg	56.7	9.1	1	04/01/19 10:21	04/01/19 14:58	87-61-6	
1,2,4-Trichlorobenzene	<12.6	ug/kg	56.7	12.6	1	04/01/19 10:21	04/01/19 14:58	120-82-1	
1,1,1-Trichloroethane	<26.4	ug/kg	56.7	26.4	1	04/01/19 10:21	04/01/19 14:58	71-55-6	
1,1,2-Trichloroethane	<6.8	ug/kg	56.7	6.8	1	04/01/19 10:21	04/01/19 14:58	79-00-5	
Trichloroethene	<8.7	ug/kg	56.7	8.7	1	04/01/19 10:21	04/01/19 14:58	79-01-6	
Trichlorofluoromethane	<98.8	ug/kg	227	98.8	1	04/01/19 10:21	04/01/19 14:58	75-69-4	M1
1,2,3-Trichloropropane	<14.8	ug/kg	227	14.8	1	04/01/19 10:21	04/01/19 14:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	<65.7	ug/kg	227	65.7	1	04/01/19 10:21	04/01/19 14:58	76-13-1	
1,2,4-Trimethylbenzene	<11.3	ug/kg	56.7	11.3	1	04/01/19 10:21	04/01/19 14:58	95-63-6	
1,3,5-Trimethylbenzene	<9.0	ug/kg	56.7	9.0	1	04/01/19 10:21	04/01/19 14:58	108-67-8	
Vinyl chloride	<11.2	ug/kg	22.7	11.2	1	04/01/19 10:21	04/01/19 14:58	75-01-4	
Xylene (Total)	<13.1	ug/kg	170	13.1	1	04/01/19 10:21	04/01/19 14:58	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	90	%	75-125		1	04/01/19 10:21	04/01/19 14:58	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1	04/01/19 10:21	04/01/19 14:58	2037-26-5	
4-Bromofluorobenzene (S)	90	%	75-125		1	04/01/19 10:21	04/01/19 14:58	460-00-4	

Sample: FD-SB-G5 (0-6ft) **Lab ID: 10468888002** Collected: 03/29/19 09:30 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	90.9	mg/kg	16.7	4.3	2	04/01/19 08:11	04/03/19 10:29		T6
Surrogates									
n-Triacontane (S)	89	%	50-150		2	04/01/19 08:11	04/03/19 10:29	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	2.9J	mg/kg	13.3	1.7	1	04/09/19 10:22	04/09/19 17:19		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: FD-SB-G5 (0-6ft) Lab ID: 10468888002 Collected: 03/29/19 09:30 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Surrogates									
a,a,a-Trifluorotoluene (S)	98	%	80-150		1	04/09/19 10:22	04/09/19 17:19	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	54.2	mg/kg	0.52	0.044	1	04/01/19 11:50	04/02/19 12:44	7440-39-3	
Silver	<0.038	mg/kg	0.52	0.038	1	04/01/19 11:50	04/02/19 12:44	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	6.1	mg/kg	0.57	0.20	20	04/01/19 11:50	04/05/19 02:32	7440-38-2	
Cadmium	0.52	mg/kg	0.091	0.030	20	04/01/19 11:50	04/05/19 02:32	7440-43-9	
Chromium	30.4	mg/kg	0.57	0.14	20	04/01/19 11:50	04/05/19 02:32	7440-47-3	
Lead	44.4	mg/kg	0.23	0.065	20	04/01/19 11:50	04/05/19 02:32	7439-92-1	
Selenium	1.1	mg/kg	0.57	0.17	20	04/01/19 11:50	04/05/19 02:32	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.023	mg/kg	0.022	0.0087	1	04/01/19 12:10	04/03/19 11:35	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	13.2	%	0.10	0.10	1		04/01/19 11:19		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<2.4	ug/kg	57.5	2.4	5	04/01/19 09:15	04/02/19 21:38	83-32-9	
Acenaphthylene	<2.8	ug/kg	57.5	2.8	5	04/01/19 09:15	04/02/19 21:38	208-96-8	
Anthracene	<2.7	ug/kg	57.5	2.7	5	04/01/19 09:15	04/02/19 21:38	120-12-7	
Benzo(a)anthracene	73.1	ug/kg	57.5	6.2	5	04/01/19 09:15	04/02/19 21:38	56-55-3	
Benzo(a)pyrene	81.8	ug/kg	57.5	4.0	5	04/01/19 09:15	04/02/19 21:38	50-32-8	
Benzo(b)fluoranthene	95.6	ug/kg	57.5	2.1	5	04/01/19 09:15	04/02/19 21:38	205-99-2	
Benzo(e)pyrene	72.8	ug/kg	57.5	4.1	5	04/01/19 09:15	04/02/19 21:38	192-97-2	N2
Benzo(g,h,i)perylene	79.6	ug/kg	57.5	3.6	5	04/01/19 09:15	04/02/19 21:38	191-24-2	
Benzo(k)fluoranthene	<4.9	ug/kg	57.5	4.9	5	04/01/19 09:15	04/02/19 21:38	207-08-9	
Chrysene	79.3	ug/kg	57.5	7.8	5	04/01/19 09:15	04/02/19 21:38	218-01-9	
Dibenz(a,h)anthracene	<2.7	ug/kg	57.5	2.7	5	04/01/19 09:15	04/02/19 21:38	53-70-3	
Fluoranthene	150	ug/kg	57.5	2.5	5	04/01/19 09:15	04/02/19 21:38	206-44-0	
Fluorene	<1.8	ug/kg	57.5	1.8	5	04/01/19 09:15	04/02/19 21:38	86-73-7	
Indeno(1,2,3-cd)pyrene	<3.9	ug/kg	57.5	3.9	5	04/01/19 09:15	04/02/19 21:38	193-39-5	
Naphthalene	<4.4	ug/kg	57.5	4.4	5	04/01/19 09:15	04/02/19 21:38	91-20-3	
Phenanthrene	70.3	ug/kg	57.5	11.0	5	04/01/19 09:15	04/02/19 21:38	85-01-8	
Pyrene	148	ug/kg	57.5	8.8	5	04/01/19 09:15	04/02/19 21:38	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	84	%	30-125		5	04/01/19 09:15	04/02/19 21:38	321-60-8	D3
p-Terphenyl-d14 (S)	74	%	30-125		5	04/01/19 09:15	04/02/19 21:38	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<407	ug/kg	1310	407	1	04/01/19 10:21	04/01/19 15:34	67-64-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: **FD-SB-G5 (0-6ft)** Lab ID: **10468888002** Collected: 03/29/19 09:30 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Allyl chloride	<54.8	ug/kg	262	54.8	1	04/01/19 10:21	04/01/19 15:34	107-05-1	
Benzene	5.1J	ug/kg	26.2	3.7	1	04/01/19 10:21	04/01/19 15:34	71-43-2	
Bromobenzene	<4.0	ug/kg	65.4	4.0	1	04/01/19 10:21	04/01/19 15:34	108-86-1	
Bromochloromethane	<22.6	ug/kg	65.4	22.6	1	04/01/19 10:21	04/01/19 15:34	74-97-5	
Bromodichloromethane	<22.4	ug/kg	65.4	22.4	1	04/01/19 10:21	04/01/19 15:34	75-27-4	
Bromoform	<99.1	ug/kg	262	99.1	1	04/01/19 10:21	04/01/19 15:34	75-25-2	
Bromomethane	<76.5	ug/kg	654	76.5	1	04/01/19 10:21	04/01/19 15:34	74-83-9	
2-Butanone (MEK)	<34.8	ug/kg	327	34.8	1	04/01/19 10:21	04/01/19 15:34	78-93-3	
n-Butylbenzene	<31.1	ug/kg	65.4	31.1	1	04/01/19 10:21	04/01/19 15:34	104-51-8	
sec-Butylbenzene	<12.5	ug/kg	65.4	12.5	1	04/01/19 10:21	04/01/19 15:34	135-98-8	
tert-Butylbenzene	<12.6	ug/kg	65.4	12.6	1	04/01/19 10:21	04/01/19 15:34	98-06-6	
Carbon tetrachloride	<31.3	ug/kg	65.4	31.3	1	04/01/19 10:21	04/01/19 15:34	56-23-5	
Chlorobenzene	<3.7	ug/kg	65.4	3.7	1	04/01/19 10:21	04/01/19 15:34	108-90-7	
Chloroethane	<34.0	ug/kg	654	34.0	1	04/01/19 10:21	04/01/19 15:34	75-00-3	
Chloroform	<32.7	ug/kg	65.4	32.7	1	04/01/19 10:21	04/01/19 15:34	67-66-3	
Chloromethane	<15.7	ug/kg	262	15.7	1	04/01/19 10:21	04/01/19 15:34	74-87-3	
2-Chlorotoluene	<3.2	ug/kg	65.4	3.2	1	04/01/19 10:21	04/01/19 15:34	95-49-8	
4-Chlorotoluene	<3.3	ug/kg	65.4	3.3	1	04/01/19 10:21	04/01/19 15:34	106-43-4	
1,2-Dibromo-3-chloropropane	<228	ug/kg	654	228	1	04/01/19 10:21	04/01/19 15:34	96-12-8	
Dibromochloromethane	<7.6	ug/kg	262	7.6	1	04/01/19 10:21	04/01/19 15:34	124-48-1	
1,2-Dibromoethane (EDB)	<6.9	ug/kg	65.4	6.9	1	04/01/19 10:21	04/01/19 15:34	106-93-4	
Dibromomethane	<12.0	ug/kg	65.4	12.0	1	04/01/19 10:21	04/01/19 15:34	74-95-3	
1,2-Dichlorobenzene	<2.6	ug/kg	65.4	2.6	1	04/01/19 10:21	04/01/19 15:34	95-50-1	
1,3-Dichlorobenzene	<2.4	ug/kg	65.4	2.4	1	04/01/19 10:21	04/01/19 15:34	541-73-1	
1,4-Dichlorobenzene	<4.1	ug/kg	65.4	4.1	1	04/01/19 10:21	04/01/19 15:34	106-46-7	
Dichlorodifluoromethane	<21.2	ug/kg	262	21.2	1	04/01/19 10:21	04/01/19 15:34	75-71-8	
1,1-Dichloroethane	<7.3	ug/kg	65.4	7.3	1	04/01/19 10:21	04/01/19 15:34	75-34-3	
1,2-Dichloroethane	<7.2	ug/kg	65.4	7.2	1	04/01/19 10:21	04/01/19 15:34	107-06-2	
1,1-Dichloroethene	<19.6	ug/kg	65.4	19.6	1	04/01/19 10:21	04/01/19 15:34	75-35-4	
cis-1,2-Dichloroethene	<10.8	ug/kg	65.4	10.8	1	04/01/19 10:21	04/01/19 15:34	156-59-2	
trans-1,2-Dichloroethene	<30.6	ug/kg	65.4	30.6	1	04/01/19 10:21	04/01/19 15:34	156-60-5	
Dichlorofluoromethane	<90.4	ug/kg	654	90.4	1	04/01/19 10:21	04/01/19 15:34	75-43-4	N2
1,2-Dichloropropane	<11.3	ug/kg	65.4	11.3	1	04/01/19 10:21	04/01/19 15:34	78-87-5	
1,3-Dichloropropane	<9.1	ug/kg	65.4	9.1	1	04/01/19 10:21	04/01/19 15:34	142-28-9	
2,2-Dichloropropane	<8.2	ug/kg	262	8.2	1	04/01/19 10:21	04/01/19 15:34	594-20-7	
1,1-Dichloropropene	<30.2	ug/kg	65.4	30.2	1	04/01/19 10:21	04/01/19 15:34	563-58-6	
cis-1,3-Dichloropropene	<9.4	ug/kg	65.4	9.4	1	04/01/19 10:21	04/01/19 15:34	10061-01-5	
trans-1,3-Dichloropropene	<9.1	ug/kg	65.4	9.1	1	04/01/19 10:21	04/01/19 15:34	10061-02-6	
Diethyl ether (Ethyl ether)	<40.0	ug/kg	262	40.0	1	04/01/19 10:21	04/01/19 15:34	60-29-7	
Ethylbenzene	<3.6	ug/kg	65.4	3.6	1	04/01/19 10:21	04/01/19 15:34	100-41-4	
Hexachloro-1,3-butadiene	<16.0	ug/kg	327	16.0	1	04/01/19 10:21	04/01/19 15:34	87-68-3	
Isopropylbenzene (Cumene)	<2.9	ug/kg	65.4	2.9	1	04/01/19 10:21	04/01/19 15:34	98-82-8	
p-Isopropyltoluene	<19.9	ug/kg	65.4	19.9	1	04/01/19 10:21	04/01/19 15:34	99-87-6	
Methylene Chloride	<123	ug/kg	262	123	1	04/01/19 10:21	04/01/19 15:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	<13.6	ug/kg	327	13.6	1	04/01/19 10:21	04/01/19 15:34	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Sample Project No.: 10468888

Sample: FD-SB-G5 (0-6ft) **Lab ID: 10468888002** Collected: 03/29/19 09:30 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Methyl-tert-butyl ether	<7.8	ug/kg	65.4	7.8	1	04/01/19 10:21	04/01/19 15:34	1634-04-4	
Naphthalene	<61.2	ug/kg	262	61.2	1	04/01/19 10:21	04/01/19 15:34	91-20-3	
n-Propylbenzene	<3.5	ug/kg	65.4	3.5	1	04/01/19 10:21	04/01/19 15:34	103-65-1	
Styrene	<3.0	ug/kg	65.4	3.0	1	04/01/19 10:21	04/01/19 15:34	100-42-5	
1,1,1,2-Tetrachloroethane	<20.5	ug/kg	65.4	20.5	1	04/01/19 10:21	04/01/19 15:34	630-20-6	
1,1,2,2-Tetrachloroethane	<11.5	ug/kg	65.4	11.5	1	04/01/19 10:21	04/01/19 15:34	79-34-5	
Tetrachloroethene	<23.0	ug/kg	65.4	23.0	1	04/01/19 10:21	04/01/19 15:34	127-18-4	
Tetrahydrofuran	<95.1	ug/kg	2620	95.1	1	04/01/19 10:21	04/01/19 15:34	109-99-9	
Toluene	<16.0	ug/kg	65.4	16.0	1	04/01/19 10:21	04/01/19 15:34	108-88-3	
1,2,3-Trichlorobenzene	<10.5	ug/kg	65.4	10.5	1	04/01/19 10:21	04/01/19 15:34	87-61-6	
1,2,4-Trichlorobenzene	<14.5	ug/kg	65.4	14.5	1	04/01/19 10:21	04/01/19 15:34	120-82-1	
1,1,1-Trichloroethane	<30.5	ug/kg	65.4	30.5	1	04/01/19 10:21	04/01/19 15:34	71-55-6	
1,1,2-Trichloroethane	<7.8	ug/kg	65.4	7.8	1	04/01/19 10:21	04/01/19 15:34	79-00-5	
Trichloroethene	<10.1	ug/kg	65.4	10.1	1	04/01/19 10:21	04/01/19 15:34	79-01-6	
Trichlorofluoromethane	<114	ug/kg	262	114	1	04/01/19 10:21	04/01/19 15:34	75-69-4	
1,2,3-Trichloropropane	<17.1	ug/kg	262	17.1	1	04/01/19 10:21	04/01/19 15:34	96-18-4	
1,1,2-Trichlorotrifluoroethane	<75.9	ug/kg	262	75.9	1	04/01/19 10:21	04/01/19 15:34	76-13-1	
1,2,4-Trimethylbenzene	<13.1	ug/kg	65.4	13.1	1	04/01/19 10:21	04/01/19 15:34	95-63-6	
1,3,5-Trimethylbenzene	<10.4	ug/kg	65.4	10.4	1	04/01/19 10:21	04/01/19 15:34	108-67-8	
Vinyl chloride	<12.9	ug/kg	26.2	12.9	1	04/01/19 10:21	04/01/19 15:34	75-01-4	
Xylene (Total)	<15.2	ug/kg	196	15.2	1	04/01/19 10:21	04/01/19 15:34	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%	75-125		1	04/01/19 10:21	04/01/19 15:34	17060-07-0	
Toluene-d8 (S)	95	%	75-125		1	04/01/19 10:21	04/01/19 15:34	2037-26-5	
4-Bromofluorobenzene (S)	91	%	75-125		1	04/01/19 10:21	04/01/19 15:34	460-00-4	

Sample: FD-SB-C3 (0-4.5ft) **Lab ID: 10468888003** Collected: 03/29/19 09:50 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	21.9	mg/kg	10.2	2.6	1	04/01/19 08:11	04/02/19 16:36		T6
Surrogates									
n-Triacontane (S)	81	%	50-150		1	04/01/19 08:11	04/02/19 16:36	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	2.9J	mg/kg	11.9	1.5	1	04/09/19 10:22	04/09/19 17:43		
Surrogates									
a,a,a-Trifluorotoluene (S)	96	%	80-150		1	04/09/19 10:22	04/09/19 17:43	98-08-8	
6010D MET ICP		Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Barium	51.7	mg/kg	0.53	0.044	1	04/01/19 11:50	04/02/19 12:49	7440-39-3	
Silver	<0.038	mg/kg	0.53	0.038	1	04/01/19 11:50	04/02/19 12:49	7440-22-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: FD-SB-C3 (0-4.5ft) **Lab ID: 10468888003** Collected: 03/29/19 09:50 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	75.1	mg/kg	0.56	0.20	20	04/01/19 11:50	04/05/19 03:07	7440-38-2	
Cadmium	0.22	mg/kg	0.089	0.030	20	04/01/19 11:50	04/05/19 03:07	7440-43-9	
Chromium	13.0	mg/kg	0.56	0.14	20	04/01/19 11:50	04/05/19 03:07	7440-47-3	
Lead	130	mg/kg	0.22	0.064	20	04/01/19 11:50	04/05/19 03:07	7439-92-1	
Selenium	0.57	mg/kg	0.56	0.16	20	04/01/19 11:50	04/05/19 03:07	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.14	mg/kg	0.022	0.0087	1	04/01/19 12:10	04/03/19 11:41	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	13.0	%	0.10	0.10	1		04/01/19 11:57		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<2.4	ug/kg	57.5	2.4	5	04/01/19 09:15	04/02/19 21:59	83-32-9	
Acenaphthylene	457	ug/kg	57.5	2.8	5	04/01/19 09:15	04/02/19 21:59	208-96-8	
Anthracene	373	ug/kg	57.5	2.7	5	04/01/19 09:15	04/02/19 21:59	120-12-7	
Benzo(a)anthracene	868	ug/kg	57.5	6.2	5	04/01/19 09:15	04/02/19 21:59	56-55-3	
Benzo(a)pyrene	981	ug/kg	57.5	3.9	5	04/01/19 09:15	04/02/19 21:59	50-32-8	
Benzo(b)fluoranthene	1250	ug/kg	57.5	2.1	5	04/01/19 09:15	04/02/19 21:59	205-99-2	
Benzo(e)pyrene	765	ug/kg	57.5	4.1	5	04/01/19 09:15	04/02/19 21:59	192-97-2	N2
Benzo(g,h,i)perylene	609	ug/kg	57.5	3.6	5	04/01/19 09:15	04/02/19 21:59	191-24-2	
Benzo(k)fluoranthene	439	ug/kg	57.5	4.9	5	04/01/19 09:15	04/02/19 21:59	207-08-9	
Chrysene	948	ug/kg	57.5	7.8	5	04/01/19 09:15	04/02/19 21:59	218-01-9	
Dibenz(a,h)anthracene	231	ug/kg	57.5	2.6	5	04/01/19 09:15	04/02/19 21:59	53-70-3	
Fluoranthene	1150	ug/kg	57.5	2.5	5	04/01/19 09:15	04/02/19 21:59	206-44-0	
Fluorene	63.1	ug/kg	57.5	1.8	5	04/01/19 09:15	04/02/19 21:59	86-73-7	
Indeno(1,2,3-cd)pyrene	541	ug/kg	57.5	3.8	5	04/01/19 09:15	04/02/19 21:59	193-39-5	
Naphthalene	<4.4	ug/kg	57.5	4.4	5	04/01/19 09:15	04/02/19 21:59	91-20-3	
Phenanthrene	135	ug/kg	57.5	11.0	5	04/01/19 09:15	04/02/19 21:59	85-01-8	
Pyrene	1440	ug/kg	57.5	8.8	5	04/01/19 09:15	04/02/19 21:59	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	86	%	30-125		5	04/01/19 09:15	04/02/19 21:59	321-60-8	D4
p-Terphenyl-d14 (S)	82	%	30-125		5	04/01/19 09:15	04/02/19 21:59	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<392	ug/kg	1260	392	1	04/01/19 10:21	04/01/19 15:52	67-64-1	
Allyl chloride	<52.8	ug/kg	252	52.8	1	04/01/19 10:21	04/01/19 15:52	107-05-1	
Benzene	<3.6	ug/kg	25.2	3.6	1	04/01/19 10:21	04/01/19 15:52	71-43-2	
Bromobenzene	<3.9	ug/kg	63.0	3.9	1	04/01/19 10:21	04/01/19 15:52	108-86-1	
Bromochloromethane	<21.8	ug/kg	63.0	21.8	1	04/01/19 10:21	04/01/19 15:52	74-97-5	
Bromodichloromethane	<21.6	ug/kg	63.0	21.6	1	04/01/19 10:21	04/01/19 15:52	75-27-4	
Bromoform	<95.4	ug/kg	252	95.4	1	04/01/19 10:21	04/01/19 15:52	75-25-2	
Bromomethane	<73.7	ug/kg	630	73.7	1	04/01/19 10:21	04/01/19 15:52	74-83-9	
2-Butanone (MEK)	<33.5	ug/kg	315	33.5	1	04/01/19 10:21	04/01/19 15:52	78-93-3	
n-Butylbenzene	<30.0	ug/kg	63.0	30.0	1	04/01/19 10:21	04/01/19 15:52	104-51-8	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: **FD-SB-C3 (0-4.5ft)** Lab ID: **10468888003** Collected: 03/29/19 09:50 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
sec-Butylbenzene	<12.1	ug/kg	63.0	12.1	1	04/01/19 10:21	04/01/19 15:52	135-98-8	
tert-Butylbenzene	<12.1	ug/kg	63.0	12.1	1	04/01/19 10:21	04/01/19 15:52	98-06-6	
Carbon tetrachloride	<30.1	ug/kg	63.0	30.1	1	04/01/19 10:21	04/01/19 15:52	56-23-5	
Chlorobenzene	<3.6	ug/kg	63.0	3.6	1	04/01/19 10:21	04/01/19 15:52	108-90-7	
Chloroethane	<32.8	ug/kg	630	32.8	1	04/01/19 10:21	04/01/19 15:52	75-00-3	
Chloroform	<31.5	ug/kg	63.0	31.5	1	04/01/19 10:21	04/01/19 15:52	67-66-3	
Chloromethane	<15.1	ug/kg	252	15.1	1	04/01/19 10:21	04/01/19 15:52	74-87-3	
2-Chlorotoluene	<3.1	ug/kg	63.0	3.1	1	04/01/19 10:21	04/01/19 15:52	95-49-8	
4-Chlorotoluene	<3.2	ug/kg	63.0	3.2	1	04/01/19 10:21	04/01/19 15:52	106-43-4	
1,2-Dibromo-3-chloropropane	<219	ug/kg	630	219	1	04/01/19 10:21	04/01/19 15:52	96-12-8	
Dibromochloromethane	<7.3	ug/kg	252	7.3	1	04/01/19 10:21	04/01/19 15:52	124-48-1	
1,2-Dibromoethane (EDB)	<6.6	ug/kg	63.0	6.6	1	04/01/19 10:21	04/01/19 15:52	106-93-4	
Dibromomethane	<11.6	ug/kg	63.0	11.6	1	04/01/19 10:21	04/01/19 15:52	74-95-3	
1,2-Dichlorobenzene	<2.5	ug/kg	63.0	2.5	1	04/01/19 10:21	04/01/19 15:52	95-50-1	
1,3-Dichlorobenzene	<2.3	ug/kg	63.0	2.3	1	04/01/19 10:21	04/01/19 15:52	541-73-1	
1,4-Dichlorobenzene	<3.9	ug/kg	63.0	3.9	1	04/01/19 10:21	04/01/19 15:52	106-46-7	
Dichlorodifluoromethane	<20.4	ug/kg	252	20.4	1	04/01/19 10:21	04/01/19 15:52	75-71-8	
1,1-Dichloroethane	<7.1	ug/kg	63.0	7.1	1	04/01/19 10:21	04/01/19 15:52	75-34-3	
1,2-Dichloroethane	<6.9	ug/kg	63.0	6.9	1	04/01/19 10:21	04/01/19 15:52	107-06-2	
1,1-Dichloroethene	<18.9	ug/kg	63.0	18.9	1	04/01/19 10:21	04/01/19 15:52	75-35-4	
cis-1,2-Dichloroethene	<10.4	ug/kg	63.0	10.4	1	04/01/19 10:21	04/01/19 15:52	156-59-2	
trans-1,2-Dichloroethene	<29.5	ug/kg	63.0	29.5	1	04/01/19 10:21	04/01/19 15:52	156-60-5	
Dichlorofluoromethane	<87.1	ug/kg	630	87.1	1	04/01/19 10:21	04/01/19 15:52	75-43-4	N2
1,2-Dichloropropane	<10.9	ug/kg	63.0	10.9	1	04/01/19 10:21	04/01/19 15:52	78-87-5	
1,3-Dichloropropane	<8.7	ug/kg	63.0	8.7	1	04/01/19 10:21	04/01/19 15:52	142-28-9	
2,2-Dichloropropane	<7.9	ug/kg	252	7.9	1	04/01/19 10:21	04/01/19 15:52	594-20-7	
1,1-Dichloropropene	<29.1	ug/kg	63.0	29.1	1	04/01/19 10:21	04/01/19 15:52	563-58-6	
cis-1,3-Dichloropropene	<9.0	ug/kg	63.0	9.0	1	04/01/19 10:21	04/01/19 15:52	10061-01-5	
trans-1,3-Dichloropropene	<8.8	ug/kg	63.0	8.8	1	04/01/19 10:21	04/01/19 15:52	10061-02-6	
Diethyl ether (Ethyl ether)	<38.6	ug/kg	252	38.6	1	04/01/19 10:21	04/01/19 15:52	60-29-7	
Ethylbenzene	<3.4	ug/kg	63.0	3.4	1	04/01/19 10:21	04/01/19 15:52	100-41-4	
Hexachloro-1,3-butadiene	<15.4	ug/kg	315	15.4	1	04/01/19 10:21	04/01/19 15:52	87-68-3	
Isopropylbenzene (Cumene)	<2.8	ug/kg	63.0	2.8	1	04/01/19 10:21	04/01/19 15:52	98-82-8	
p-Isopropyltoluene	<19.2	ug/kg	63.0	19.2	1	04/01/19 10:21	04/01/19 15:52	99-87-6	
Methylene Chloride	<119	ug/kg	252	119	1	04/01/19 10:21	04/01/19 15:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	<13.1	ug/kg	315	13.1	1	04/01/19 10:21	04/01/19 15:52	108-10-1	
Methyl-tert-butyl ether	<7.5	ug/kg	63.0	7.5	1	04/01/19 10:21	04/01/19 15:52	1634-04-4	
Naphthalene	<59.0	ug/kg	252	59.0	1	04/01/19 10:21	04/01/19 15:52	91-20-3	
n-Propylbenzene	<3.4	ug/kg	63.0	3.4	1	04/01/19 10:21	04/01/19 15:52	103-65-1	
Styrene	<2.9	ug/kg	63.0	2.9	1	04/01/19 10:21	04/01/19 15:52	100-42-5	
1,1,1,2-Tetrachloroethane	<19.8	ug/kg	63.0	19.8	1	04/01/19 10:21	04/01/19 15:52	630-20-6	
1,1,2,2-Tetrachloroethane	<11.1	ug/kg	63.0	11.1	1	04/01/19 10:21	04/01/19 15:52	79-34-5	
Tetrachloroethene	<22.2	ug/kg	63.0	22.2	1	04/01/19 10:21	04/01/19 15:52	127-18-4	
Tetrahydrofuran	<91.6	ug/kg	2520	91.6	1	04/01/19 10:21	04/01/19 15:52	109-99-9	
Toluene	<15.4	ug/kg	63.0	15.4	1	04/01/19 10:21	04/01/19 15:52	108-88-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: FD-SB-C3 (0-4.5ft) **Lab ID: 10468888003** Collected: 03/29/19 09:50 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,2,3-Trichlorobenzene	<10.1	ug/kg	63.0	10.1	1	04/01/19 10:21	04/01/19 15:52	87-61-6	
1,2,4-Trichlorobenzene	<14.0	ug/kg	63.0	14.0	1	04/01/19 10:21	04/01/19 15:52	120-82-1	
1,1,1-Trichloroethane	<29.4	ug/kg	63.0	29.4	1	04/01/19 10:21	04/01/19 15:52	71-55-6	
1,1,2-Trichloroethane	<7.5	ug/kg	63.0	7.5	1	04/01/19 10:21	04/01/19 15:52	79-00-5	
Trichloroethene	<9.7	ug/kg	63.0	9.7	1	04/01/19 10:21	04/01/19 15:52	79-01-6	
Trichlorofluoromethane	<110	ug/kg	252	110	1	04/01/19 10:21	04/01/19 15:52	75-69-4	
1,2,3-Trichloropropane	<16.5	ug/kg	252	16.5	1	04/01/19 10:21	04/01/19 15:52	96-18-4	
1,1,2-Trichlorotrifluoroethane	<73.1	ug/kg	252	73.1	1	04/01/19 10:21	04/01/19 15:52	76-13-1	
1,2,4-Trimethylbenzene	<12.6	ug/kg	63.0	12.6	1	04/01/19 10:21	04/01/19 15:52	95-63-6	
1,3,5-Trimethylbenzene	<10.0	ug/kg	63.0	10.0	1	04/01/19 10:21	04/01/19 15:52	108-67-8	
Vinyl chloride	<12.4	ug/kg	25.2	12.4	1	04/01/19 10:21	04/01/19 15:52	75-01-4	
Xylene (Total)	<14.6	ug/kg	189	14.6	1	04/01/19 10:21	04/01/19 15:52	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%	75-125		1	04/01/19 10:21	04/01/19 15:52	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1	04/01/19 10:21	04/01/19 15:52	2037-26-5	
4-Bromofluorobenzene (S)	91	%	75-125		1	04/01/19 10:21	04/01/19 15:52	460-00-4	

Sample: FD-SB-A4 (0-3ft) **Lab ID: 10468888004** Collected: 03/29/19 10:15 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	47.5	mg/kg	19.5	5.1	2	04/01/19 08:11	04/03/19 10:36		T6
Surrogates									
n-Triacontane (S)	105	%	50-150		2	04/01/19 08:11	04/03/19 10:36	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.5	mg/kg	11.8	1.5	1	04/09/19 10:22	04/09/19 20:11		
Surrogates									
a,a,a-Trifluorotoluene (S)	109	%	80-150		1	04/09/19 10:22	04/09/19 20:11	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	57.6	mg/kg	0.54	0.045	1	04/01/19 11:50	04/02/19 12:50	7440-39-3	
Silver	<0.039	mg/kg	0.54	0.039	1	04/01/19 11:50	04/02/19 12:50	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	4.5	mg/kg	0.56	0.20	20	04/01/19 11:50	04/05/19 03:10	7440-38-2	
Cadmium	0.18	mg/kg	0.090	0.030	20	04/01/19 11:50	04/05/19 03:10	7440-43-9	
Chromium	11.3	mg/kg	0.56	0.14	20	04/01/19 11:50	04/05/19 03:10	7440-47-3	
Lead	26.8	mg/kg	0.23	0.065	20	04/01/19 11:50	04/05/19 03:10	7439-92-1	
Selenium	0.57	mg/kg	0.56	0.16	20	04/01/19 11:50	04/05/19 03:10	7782-49-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: FD-SB-A4 (0-3ft) **Lab ID: 10468888004** Collected: 03/29/19 10:15 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.031	mg/kg	0.023	0.0091	1	04/01/19 12:10	04/03/19 11:43	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	14.7	%	0.10	0.10	1		04/01/19 11:57		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<2.4	ug/kg	58.4	2.4	5	04/01/19 09:15	04/02/19 22:20	83-32-9	
Acenaphthylene	<2.9	ug/kg	58.4	2.9	5	04/01/19 09:15	04/02/19 22:20	208-96-8	
Anthracene	114	ug/kg	58.4	2.7	5	04/01/19 09:15	04/02/19 22:20	120-12-7	
Benzo(a)anthracene	211	ug/kg	58.4	6.3	5	04/01/19 09:15	04/02/19 22:20	56-55-3	
Benzo(a)pyrene	199	ug/kg	58.4	4.0	5	04/01/19 09:15	04/02/19 22:20	50-32-8	
Benzo(b)fluoranthene	220	ug/kg	58.4	2.2	5	04/01/19 09:15	04/02/19 22:20	205-99-2	
Benzo(e)pyrene	133	ug/kg	58.4	4.2	5	04/01/19 09:15	04/02/19 22:20	192-97-2	N2
Benzo(g,h,i)perylene	149	ug/kg	58.4	3.7	5	04/01/19 09:15	04/02/19 22:20	191-24-2	
Benzo(k)fluoranthene	99.8	ug/kg	58.4	4.9	5	04/01/19 09:15	04/02/19 22:20	207-08-9	
Chrysene	184	ug/kg	58.4	7.9	5	04/01/19 09:15	04/02/19 22:20	218-01-9	
Dibenz(a,h)anthracene	<2.7	ug/kg	58.4	2.7	5	04/01/19 09:15	04/02/19 22:20	53-70-3	
Fluoranthene	416	ug/kg	58.4	2.5	5	04/01/19 09:15	04/02/19 22:20	206-44-0	
Fluorene	<1.8	ug/kg	58.4	1.8	5	04/01/19 09:15	04/02/19 22:20	86-73-7	
Indeno(1,2,3-cd)pyrene	136	ug/kg	58.4	3.9	5	04/01/19 09:15	04/02/19 22:20	193-39-5	
Naphthalene	<4.5	ug/kg	58.4	4.5	5	04/01/19 09:15	04/02/19 22:20	91-20-3	
Phenanthrene	352	ug/kg	58.4	11.2	5	04/01/19 09:15	04/02/19 22:20	85-01-8	
Pyrene	427	ug/kg	58.4	8.9	5	04/01/19 09:15	04/02/19 22:20	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	80	%	30-125		5	04/01/19 09:15	04/02/19 22:20	321-60-8	D3
p-Terphenyl-d14 (S)	70	%	30-125		5	04/01/19 09:15	04/02/19 22:20	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<375	ug/kg	1210	375	1	04/01/19 10:21	04/01/19 16:10	67-64-1	
Allyl chloride	<50.5	ug/kg	241	50.5	1	04/01/19 10:21	04/01/19 16:10	107-05-1	
Benzene	<3.4	ug/kg	24.1	3.4	1	04/01/19 10:21	04/01/19 16:10	71-43-2	
Bromobenzene	<3.7	ug/kg	60.3	3.7	1	04/01/19 10:21	04/01/19 16:10	108-86-1	
Bromochloromethane	<20.9	ug/kg	60.3	20.9	1	04/01/19 10:21	04/01/19 16:10	74-97-5	
Bromodichloromethane	<20.6	ug/kg	60.3	20.6	1	04/01/19 10:21	04/01/19 16:10	75-27-4	
Bromoform	<91.3	ug/kg	241	91.3	1	04/01/19 10:21	04/01/19 16:10	75-25-2	
Bromomethane	<70.5	ug/kg	603	70.5	1	04/01/19 10:21	04/01/19 16:10	74-83-9	
2-Butanone (MEK)	<32.1	ug/kg	301	32.1	1	04/01/19 10:21	04/01/19 16:10	78-93-3	
n-Butylbenzene	<28.7	ug/kg	60.3	28.7	1	04/01/19 10:21	04/01/19 16:10	104-51-8	
sec-Butylbenzene	<11.5	ug/kg	60.3	11.5	1	04/01/19 10:21	04/01/19 16:10	135-98-8	
tert-Butylbenzene	<11.6	ug/kg	60.3	11.6	1	04/01/19 10:21	04/01/19 16:10	98-06-6	
Carbon tetrachloride	<28.8	ug/kg	60.3	28.8	1	04/01/19 10:21	04/01/19 16:10	56-23-5	
Chlorobenzene	<3.4	ug/kg	60.3	3.4	1	04/01/19 10:21	04/01/19 16:10	108-90-7	
Chloroethane	<31.3	ug/kg	603	31.3	1	04/01/19 10:21	04/01/19 16:10	75-00-3	
Chloroform	<30.1	ug/kg	60.3	30.1	1	04/01/19 10:21	04/01/19 16:10	67-66-3	
Chloromethane	<14.5	ug/kg	241	14.5	1	04/01/19 10:21	04/01/19 16:10	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: **FD-SB-A4 (0-3ft)** Lab ID: **10468888004** Collected: 03/29/19 10:15 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
2-Chlorotoluene	<3.0	ug/kg	60.3	3.0	1	04/01/19 10:21	04/01/19 16:10	95-49-8	
4-Chlorotoluene	<3.1	ug/kg	60.3	3.1	1	04/01/19 10:21	04/01/19 16:10	106-43-4	
1,2-Dibromo-3-chloropropane	<210	ug/kg	603	210	1	04/01/19 10:21	04/01/19 16:10	96-12-8	
Dibromochloromethane	<7.0	ug/kg	241	7.0	1	04/01/19 10:21	04/01/19 16:10	124-48-1	
1,2-Dibromoethane (EDB)	<6.3	ug/kg	60.3	6.3	1	04/01/19 10:21	04/01/19 16:10	106-93-4	
Dibromomethane	<11.1	ug/kg	60.3	11.1	1	04/01/19 10:21	04/01/19 16:10	74-95-3	
1,2-Dichlorobenzene	<2.4	ug/kg	60.3	2.4	1	04/01/19 10:21	04/01/19 16:10	95-50-1	
1,3-Dichlorobenzene	<2.2	ug/kg	60.3	2.2	1	04/01/19 10:21	04/01/19 16:10	541-73-1	
1,4-Dichlorobenzene	<3.7	ug/kg	60.3	3.7	1	04/01/19 10:21	04/01/19 16:10	106-46-7	
Dichlorodifluoromethane	<19.5	ug/kg	241	19.5	1	04/01/19 10:21	04/01/19 16:10	75-71-8	
1,1-Dichloroethane	<6.8	ug/kg	60.3	6.8	1	04/01/19 10:21	04/01/19 16:10	75-34-3	
1,2-Dichloroethane	<6.6	ug/kg	60.3	6.6	1	04/01/19 10:21	04/01/19 16:10	107-06-2	
1,1-Dichloroethene	<18.1	ug/kg	60.3	18.1	1	04/01/19 10:21	04/01/19 16:10	75-35-4	
cis-1,2-Dichloroethene	<10	ug/kg	60.3	10	1	04/01/19 10:21	04/01/19 16:10	156-59-2	
trans-1,2-Dichloroethene	<28.2	ug/kg	60.3	28.2	1	04/01/19 10:21	04/01/19 16:10	156-60-5	
Dichlorofluoromethane	<83.3	ug/kg	603	83.3	1	04/01/19 10:21	04/01/19 16:10	75-43-4	N2
1,2-Dichloropropane	<10.4	ug/kg	60.3	10.4	1	04/01/19 10:21	04/01/19 16:10	78-87-5	
1,3-Dichloropropane	<8.3	ug/kg	60.3	8.3	1	04/01/19 10:21	04/01/19 16:10	142-28-9	
2,2-Dichloropropane	<7.5	ug/kg	241	7.5	1	04/01/19 10:21	04/01/19 16:10	594-20-7	
1,1-Dichloropropene	<27.8	ug/kg	60.3	27.8	1	04/01/19 10:21	04/01/19 16:10	563-58-6	
cis-1,3-Dichloropropene	<8.6	ug/kg	60.3	8.6	1	04/01/19 10:21	04/01/19 16:10	10061-01-5	
trans-1,3-Dichloropropene	<8.4	ug/kg	60.3	8.4	1	04/01/19 10:21	04/01/19 16:10	10061-02-6	
Diethyl ether (Ethyl ether)	<36.9	ug/kg	241	36.9	1	04/01/19 10:21	04/01/19 16:10	60-29-7	
Ethylbenzene	<3.3	ug/kg	60.3	3.3	1	04/01/19 10:21	04/01/19 16:10	100-41-4	
Hexachloro-1,3-butadiene	<14.7	ug/kg	301	14.7	1	04/01/19 10:21	04/01/19 16:10	87-68-3	
Isopropylbenzene (Cumene)	<2.7	ug/kg	60.3	2.7	1	04/01/19 10:21	04/01/19 16:10	98-82-8	
p-Isopropyltoluene	<18.3	ug/kg	60.3	18.3	1	04/01/19 10:21	04/01/19 16:10	99-87-6	
Methylene Chloride	<113	ug/kg	241	113	1	04/01/19 10:21	04/01/19 16:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	<12.5	ug/kg	301	12.5	1	04/01/19 10:21	04/01/19 16:10	108-10-1	
Methyl-tert-butyl ether	<7.2	ug/kg	60.3	7.2	1	04/01/19 10:21	04/01/19 16:10	1634-04-4	
Naphthalene	<56.4	ug/kg	241	56.4	1	04/01/19 10:21	04/01/19 16:10	91-20-3	
n-Propylbenzene	<3.2	ug/kg	60.3	3.2	1	04/01/19 10:21	04/01/19 16:10	103-65-1	
Styrene	<2.7	ug/kg	60.3	2.7	1	04/01/19 10:21	04/01/19 16:10	100-42-5	
1,1,1,2-Tetrachloroethane	<18.9	ug/kg	60.3	18.9	1	04/01/19 10:21	04/01/19 16:10	630-20-6	
1,1,1,2,2-Tetrachloroethane	<10.6	ug/kg	60.3	10.6	1	04/01/19 10:21	04/01/19 16:10	79-34-5	
Tetrachloroethene	<21.2	ug/kg	60.3	21.2	1	04/01/19 10:21	04/01/19 16:10	127-18-4	
Tetrahydrofuran	<87.6	ug/kg	2410	87.6	1	04/01/19 10:21	04/01/19 16:10	109-99-9	
Toluene	<14.7	ug/kg	60.3	14.7	1	04/01/19 10:21	04/01/19 16:10	108-88-3	
1,2,3-Trichlorobenzene	<9.6	ug/kg	60.3	9.6	1	04/01/19 10:21	04/01/19 16:10	87-61-6	
1,2,4-Trichlorobenzene	<13.4	ug/kg	60.3	13.4	1	04/01/19 10:21	04/01/19 16:10	120-82-1	
1,1,1-Trichloroethane	<28.1	ug/kg	60.3	28.1	1	04/01/19 10:21	04/01/19 16:10	71-55-6	
1,1,2-Trichloroethane	<7.2	ug/kg	60.3	7.2	1	04/01/19 10:21	04/01/19 16:10	79-00-5	
Trichloroethene	<9.3	ug/kg	60.3	9.3	1	04/01/19 10:21	04/01/19 16:10	79-01-6	
Trichlorofluoromethane	<105	ug/kg	241	105	1	04/01/19 10:21	04/01/19 16:10	75-69-4	
1,2,3-Trichloropropane	<15.8	ug/kg	241	15.8	1	04/01/19 10:21	04/01/19 16:10	96-18-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: FD-SB-A4 (0-3ft) **Lab ID: 10468888004** Collected: 03/29/19 10:15 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,2-Trichlorotrifluoroethane	<69.9	ug/kg	241	69.9	1	04/01/19 10:21	04/01/19 16:10	76-13-1	
1,2,4-Trimethylbenzene	<12.1	ug/kg	60.3	12.1	1	04/01/19 10:21	04/01/19 16:10	95-63-6	
1,3,5-Trimethylbenzene	<9.6	ug/kg	60.3	9.6	1	04/01/19 10:21	04/01/19 16:10	108-67-8	
Vinyl chloride	<11.9	ug/kg	24.1	11.9	1	04/01/19 10:21	04/01/19 16:10	75-01-4	
Xylene (Total)	<14.0	ug/kg	181	14.0	1	04/01/19 10:21	04/01/19 16:10	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	95	%	75-125		1	04/01/19 10:21	04/01/19 16:10	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1	04/01/19 10:21	04/01/19 16:10	2037-26-5	
4-Bromofluorobenzene (S)	89	%	75-125		1	04/01/19 10:21	04/01/19 16:10	460-00-4	

Sample: FD-SB-B1 (0-7.5ft) **Lab ID: 10468888005** Collected: 03/29/19 10:40 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	16.7	mg/kg	8.9	2.3	1	04/01/19 08:11	04/02/19 16:43		T6
Surrogates									
n-Triacontane (S)	86	%	50-150		1	04/01/19 08:11	04/02/19 16:43	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	2.0J	mg/kg	11.7	1.5	1	04/09/19 10:22	04/09/19 20:35		
Surrogates									
a,a,a-Trifluorotoluene (S)	95	%	80-150		1	04/09/19 10:22	04/09/19 20:35	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	48.7	mg/kg	0.52	0.043	1	04/01/19 11:50	04/02/19 12:52	7440-39-3	
Silver	<0.038	mg/kg	0.52	0.038	1	04/01/19 11:50	04/02/19 12:52	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	4.8	mg/kg	0.51	0.18	20	04/01/19 11:50	04/05/19 03:14	7440-38-2	
Cadmium	0.14	mg/kg	0.082	0.027	20	04/01/19 11:50	04/05/19 03:14	7440-43-9	
Chromium	17.7	mg/kg	0.51	0.13	20	04/01/19 11:50	04/05/19 03:14	7440-47-3	
Lead	18.1	mg/kg	0.21	0.059	20	04/01/19 11:50	04/05/19 03:14	7439-92-1	
Selenium	1.0	mg/kg	0.51	0.15	20	04/01/19 11:50	04/05/19 03:14	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.024	mg/kg	0.021	0.0083	1	04/01/19 12:10	04/03/19 11:46	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	11.7	%	0.10	0.10	1		04/01/19 11:57		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: **FD-SB-B1 (0-7.5ft)** Lab ID: **10468888005** Collected: 03/29/19 10:40 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<2.3	ug/kg	56.6	2.3	5	04/01/19 09:15	04/02/19 22:41	83-32-9	
Acenaphthylene	89.3	ug/kg	56.6	2.8	5	04/01/19 09:15	04/02/19 22:41	208-96-8	
Anthracene	128	ug/kg	56.6	2.6	5	04/01/19 09:15	04/02/19 22:41	120-12-7	
Benzo(a)anthracene	335	ug/kg	56.6	6.1	5	04/01/19 09:15	04/02/19 22:41	56-55-3	
Benzo(a)pyrene	351	ug/kg	56.6	3.9	5	04/01/19 09:15	04/02/19 22:41	50-32-8	
Benzo(b)fluoranthene	451	ug/kg	56.6	2.1	5	04/01/19 09:15	04/02/19 22:41	205-99-2	
Benzo(e)pyrene	238	ug/kg	56.6	4.1	5	04/01/19 09:15	04/02/19 22:41	192-97-2	N2
Benzo(g,h,i)perylene	243	ug/kg	56.6	3.6	5	04/01/19 09:15	04/02/19 22:41	191-24-2	
Benzo(k)fluoranthene	194	ug/kg	56.6	4.8	5	04/01/19 09:15	04/02/19 22:41	207-08-9	
Chrysene	328	ug/kg	56.6	7.7	5	04/01/19 09:15	04/02/19 22:41	218-01-9	
Dibenz(a,h)anthracene	68.5	ug/kg	56.6	2.6	5	04/01/19 09:15	04/02/19 22:41	53-70-3	
Fluoranthene	673	ug/kg	56.6	2.4	5	04/01/19 09:15	04/02/19 22:41	206-44-0	
Fluorene	<1.8	ug/kg	56.6	1.8	5	04/01/19 09:15	04/02/19 22:41	86-73-7	
Indeno(1,2,3-cd)pyrene	234	ug/kg	56.6	3.8	5	04/01/19 09:15	04/02/19 22:41	193-39-5	
Naphthalene	<4.4	ug/kg	56.6	4.4	5	04/01/19 09:15	04/02/19 22:41	91-20-3	
Phenanthrene	306	ug/kg	56.6	10.9	5	04/01/19 09:15	04/02/19 22:41	85-01-8	
Pyrene	556	ug/kg	56.6	8.7	5	04/01/19 09:15	04/02/19 22:41	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	89	%	30-125		5	04/01/19 09:15	04/02/19 22:41	321-60-8	D3
p-Terphenyl-d14 (S)	79	%	30-125		5	04/01/19 09:15	04/02/19 22:41	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<339	ug/kg	1090	339	1	04/01/19 10:21	04/01/19 16:28	67-64-1	
Allyl chloride	<45.7	ug/kg	218	45.7	1	04/01/19 10:21	04/01/19 16:28	107-05-1	
Benzene	<3.1	ug/kg	21.8	3.1	1	04/01/19 10:21	04/01/19 16:28	71-43-2	
Bromobenzene	<3.3	ug/kg	54.5	3.3	1	04/01/19 10:21	04/01/19 16:28	108-86-1	
Bromochloromethane	<18.9	ug/kg	54.5	18.9	1	04/01/19 10:21	04/01/19 16:28	74-97-5	
Bromodichloromethane	<18.7	ug/kg	54.5	18.7	1	04/01/19 10:21	04/01/19 16:28	75-27-4	
Bromoform	<82.6	ug/kg	218	82.6	1	04/01/19 10:21	04/01/19 16:28	75-25-2	
Bromomethane	<63.8	ug/kg	545	63.8	1	04/01/19 10:21	04/01/19 16:28	74-83-9	
2-Butanone (MEK)	<29.0	ug/kg	273	29.0	1	04/01/19 10:21	04/01/19 16:28	78-93-3	
n-Butylbenzene	<26.0	ug/kg	54.5	26.0	1	04/01/19 10:21	04/01/19 16:28	104-51-8	
sec-Butylbenzene	<10.4	ug/kg	54.5	10.4	1	04/01/19 10:21	04/01/19 16:28	135-98-8	
tert-Butylbenzene	<10.5	ug/kg	54.5	10.5	1	04/01/19 10:21	04/01/19 16:28	98-06-6	
Carbon tetrachloride	<26.1	ug/kg	54.5	26.1	1	04/01/19 10:21	04/01/19 16:28	56-23-5	
Chlorobenzene	<3.1	ug/kg	54.5	3.1	1	04/01/19 10:21	04/01/19 16:28	108-90-7	
Chloroethane	<28.4	ug/kg	545	28.4	1	04/01/19 10:21	04/01/19 16:28	75-00-3	
Chloroform	<27.3	ug/kg	54.5	27.3	1	04/01/19 10:21	04/01/19 16:28	67-66-3	
Chloromethane	<13.1	ug/kg	218	13.1	1	04/01/19 10:21	04/01/19 16:28	74-87-3	
2-Chlorotoluene	<2.7	ug/kg	54.5	2.7	1	04/01/19 10:21	04/01/19 16:28	95-49-8	
4-Chlorotoluene	<2.8	ug/kg	54.5	2.8	1	04/01/19 10:21	04/01/19 16:28	106-43-4	
1,2-Dibromo-3-chloropropane	<190	ug/kg	545	190	1	04/01/19 10:21	04/01/19 16:28	96-12-8	
Dibromochloromethane	<6.3	ug/kg	218	6.3	1	04/01/19 10:21	04/01/19 16:28	124-48-1	
1,2-Dibromoethane (EDB)	<5.7	ug/kg	54.5	5.7	1	04/01/19 10:21	04/01/19 16:28	106-93-4	
Dibromomethane	<10.0	ug/kg	54.5	10.0	1	04/01/19 10:21	04/01/19 16:28	74-95-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: **FD-SB-B1 (0-7.5ft)** Lab ID: **10468888005** Collected: 03/29/19 10:40 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,2-Dichlorobenzene	<2.2	ug/kg	54.5	2.2	1	04/01/19 10:21	04/01/19 16:28	95-50-1	
1,3-Dichlorobenzene	<2.0	ug/kg	54.5	2.0	1	04/01/19 10:21	04/01/19 16:28	541-73-1	
1,4-Dichlorobenzene	<3.4	ug/kg	54.5	3.4	1	04/01/19 10:21	04/01/19 16:28	106-46-7	
Dichlorodifluoromethane	<17.7	ug/kg	218	17.7	1	04/01/19 10:21	04/01/19 16:28	75-71-8	
1,1-Dichloroethane	<6.1	ug/kg	54.5	6.1	1	04/01/19 10:21	04/01/19 16:28	75-34-3	
1,2-Dichloroethane	<6.0	ug/kg	54.5	6.0	1	04/01/19 10:21	04/01/19 16:28	107-06-2	
1,1-Dichloroethene	<16.4	ug/kg	54.5	16.4	1	04/01/19 10:21	04/01/19 16:28	75-35-4	
cis-1,2-Dichloroethene	<9.0	ug/kg	54.5	9.0	1	04/01/19 10:21	04/01/19 16:28	156-59-2	
trans-1,2-Dichloroethene	<25.5	ug/kg	54.5	25.5	1	04/01/19 10:21	04/01/19 16:28	156-60-5	
Dichlorofluoromethane	<75.4	ug/kg	545	75.4	1	04/01/19 10:21	04/01/19 16:28	75-43-4	N2
1,2-Dichloropropane	<9.4	ug/kg	54.5	9.4	1	04/01/19 10:21	04/01/19 16:28	78-87-5	
1,3-Dichloropropane	<7.5	ug/kg	54.5	7.5	1	04/01/19 10:21	04/01/19 16:28	142-28-9	
2,2-Dichloropropane	<6.8	ug/kg	218	6.8	1	04/01/19 10:21	04/01/19 16:28	594-20-7	
1,1-Dichloropropene	<25.2	ug/kg	54.5	25.2	1	04/01/19 10:21	04/01/19 16:28	563-58-6	
cis-1,3-Dichloropropene	<7.8	ug/kg	54.5	7.8	1	04/01/19 10:21	04/01/19 16:28	10061-01-5	
trans-1,3-Dichloropropene	<7.6	ug/kg	54.5	7.6	1	04/01/19 10:21	04/01/19 16:28	10061-02-6	
Diethyl ether (Ethyl ether)	<33.4	ug/kg	218	33.4	1	04/01/19 10:21	04/01/19 16:28	60-29-7	
Ethylbenzene	<3.0	ug/kg	54.5	3.0	1	04/01/19 10:21	04/01/19 16:28	100-41-4	
Hexachloro-1,3-butadiene	<13.3	ug/kg	273	13.3	1	04/01/19 10:21	04/01/19 16:28	87-68-3	
Isopropylbenzene (Cumene)	<2.4	ug/kg	54.5	2.4	1	04/01/19 10:21	04/01/19 16:28	98-82-8	
p-Isopropyltoluene	<16.6	ug/kg	54.5	16.6	1	04/01/19 10:21	04/01/19 16:28	99-87-6	
Methylene Chloride	<103	ug/kg	218	103	1	04/01/19 10:21	04/01/19 16:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	<11.3	ug/kg	273	11.3	1	04/01/19 10:21	04/01/19 16:28	108-10-1	
Methyl-tert-butyl ether	<6.5	ug/kg	54.5	6.5	1	04/01/19 10:21	04/01/19 16:28	1634-04-4	
Naphthalene	<51.0	ug/kg	218	51.0	1	04/01/19 10:21	04/01/19 16:28	91-20-3	
n-Propylbenzene	<2.9	ug/kg	54.5	2.9	1	04/01/19 10:21	04/01/19 16:28	103-65-1	
Styrene	<2.5	ug/kg	54.5	2.5	1	04/01/19 10:21	04/01/19 16:28	100-42-5	
1,1,1,2-Tetrachloroethane	<17.1	ug/kg	54.5	17.1	1	04/01/19 10:21	04/01/19 16:28	630-20-6	
1,1,2,2-Tetrachloroethane	<9.6	ug/kg	54.5	9.6	1	04/01/19 10:21	04/01/19 16:28	79-34-5	
Tetrachloroethene	<19.2	ug/kg	54.5	19.2	1	04/01/19 10:21	04/01/19 16:28	127-18-4	
Tetrahydrofuran	<79.3	ug/kg	2180	79.3	1	04/01/19 10:21	04/01/19 16:28	109-99-9	
Toluene	<13.3	ug/kg	54.5	13.3	1	04/01/19 10:21	04/01/19 16:28	108-88-3	
1,2,3-Trichlorobenzene	<8.7	ug/kg	54.5	8.7	1	04/01/19 10:21	04/01/19 16:28	87-61-6	
1,2,4-Trichlorobenzene	<12.1	ug/kg	54.5	12.1	1	04/01/19 10:21	04/01/19 16:28	120-82-1	
1,1,1-Trichloroethane	<25.4	ug/kg	54.5	25.4	1	04/01/19 10:21	04/01/19 16:28	71-55-6	
1,1,2-Trichloroethane	<6.5	ug/kg	54.5	6.5	1	04/01/19 10:21	04/01/19 16:28	79-00-5	
Trichloroethene	<8.4	ug/kg	54.5	8.4	1	04/01/19 10:21	04/01/19 16:28	79-01-6	
Trichlorofluoromethane	<95.1	ug/kg	218	95.1	1	04/01/19 10:21	04/01/19 16:28	75-69-4	
1,2,3-Trichloropropane	<14.3	ug/kg	218	14.3	1	04/01/19 10:21	04/01/19 16:28	96-18-4	
1,1,2-Trichlorotrifluoroethane	<63.3	ug/kg	218	63.3	1	04/01/19 10:21	04/01/19 16:28	76-13-1	
1,2,4-Trimethylbenzene	<10.9	ug/kg	54.5	10.9	1	04/01/19 10:21	04/01/19 16:28	95-63-6	
1,3,5-Trimethylbenzene	<8.7	ug/kg	54.5	8.7	1	04/01/19 10:21	04/01/19 16:28	108-67-8	
Vinyl chloride	<10.7	ug/kg	21.8	10.7	1	04/01/19 10:21	04/01/19 16:28	75-01-4	
Xylene (Total)	<12.7	ug/kg	164	12.7	1	04/01/19 10:21	04/01/19 16:28	1330-20-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Project No.: 10468888

Sample: FD-SB-B1 (0-7.5ft) **Lab ID: 10468888005** Collected: 03/29/19 10:40 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Surrogates									
1,2-Dichloroethane-d4 (S)	91	%	75-125		1	04/01/19 10:21	04/01/19 16:28	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1	04/01/19 10:21	04/01/19 16:28	2037-26-5	
4-Bromofluorobenzene (S)	89	%	75-125		1	04/01/19 10:21	04/01/19 16:28	460-00-4	

Sample: Trip Blank **Lab ID: 10468888006** Collected: 03/29/19 00:00 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	<1.3	mg/kg	10.0	1.3	1	04/09/19 10:22	04/10/19 01:30		
Surrogates									
a,a,a-Trifluorotoluene (S)	102	%	80-150		1	04/09/19 10:22	04/10/19 01:30	98-08-8	

8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	<311	ug/kg	1000	311	1	04/01/19 10:21	04/01/19 14:40	67-64-1	
Allyl chloride	<41.9	ug/kg	200	41.9	1	04/01/19 10:21	04/01/19 14:40	107-05-1	
Benzene	<2.8	ug/kg	20.0	2.8	1	04/01/19 10:21	04/01/19 14:40	71-43-2	
Bromobenzene	<3.1	ug/kg	50.0	3.1	1	04/01/19 10:21	04/01/19 14:40	108-86-1	
Bromochloromethane	<17.3	ug/kg	50.0	17.3	1	04/01/19 10:21	04/01/19 14:40	74-97-5	
Bromodichloromethane	<17.1	ug/kg	50.0	17.1	1	04/01/19 10:21	04/01/19 14:40	75-27-4	
Bromoform	<75.7	ug/kg	200	75.7	1	04/01/19 10:21	04/01/19 14:40	75-25-2	
Bromomethane	<58.5	ug/kg	500	58.5	1	04/01/19 10:21	04/01/19 14:40	74-83-9	
2-Butanone (MEK)	<26.6	ug/kg	250	26.6	1	04/01/19 10:21	04/01/19 14:40	78-93-3	
n-Butylbenzene	<23.8	ug/kg	50.0	23.8	1	04/01/19 10:21	04/01/19 14:40	104-51-8	
sec-Butylbenzene	<9.6	ug/kg	50.0	9.6	1	04/01/19 10:21	04/01/19 14:40	135-98-8	
tert-Butylbenzene	<9.6	ug/kg	50.0	9.6	1	04/01/19 10:21	04/01/19 14:40	98-06-6	
Carbon tetrachloride	<23.9	ug/kg	50.0	23.9	1	04/01/19 10:21	04/01/19 14:40	56-23-5	
Chlorobenzene	<2.8	ug/kg	50.0	2.8	1	04/01/19 10:21	04/01/19 14:40	108-90-7	
Chloroethane	<26.0	ug/kg	500	26.0	1	04/01/19 10:21	04/01/19 14:40	75-00-3	
Chloroform	<25.0	ug/kg	50.0	25.0	1	04/01/19 10:21	04/01/19 14:40	67-66-3	
Chloromethane	<12.0	ug/kg	200	12.0	1	04/01/19 10:21	04/01/19 14:40	74-87-3	
2-Chlorotoluene	<2.5	ug/kg	50.0	2.5	1	04/01/19 10:21	04/01/19 14:40	95-49-8	
4-Chlorotoluene	<2.6	ug/kg	50.0	2.6	1	04/01/19 10:21	04/01/19 14:40	106-43-4	
1,2-Dibromo-3-chloropropane	<174	ug/kg	500	174	1	04/01/19 10:21	04/01/19 14:40	96-12-8	
Dibromochloromethane	<5.8	ug/kg	200	5.8	1	04/01/19 10:21	04/01/19 14:40	124-48-1	
1,2-Dibromoethane (EDB)	<5.3	ug/kg	50.0	5.3	1	04/01/19 10:21	04/01/19 14:40	106-93-4	
Dibromomethane	<9.2	ug/kg	50.0	9.2	1	04/01/19 10:21	04/01/19 14:40	74-95-3	
1,2-Dichlorobenzene	<2.0	ug/kg	50.0	2.0	1	04/01/19 10:21	04/01/19 14:40	95-50-1	
1,3-Dichlorobenzene	<1.8	ug/kg	50.0	1.8	1	04/01/19 10:21	04/01/19 14:40	541-73-1	
1,4-Dichlorobenzene	<3.1	ug/kg	50.0	3.1	1	04/01/19 10:21	04/01/19 14:40	106-46-7	
Dichlorodifluoromethane	<16.2	ug/kg	200	16.2	1	04/01/19 10:21	04/01/19 14:40	75-71-8	
1,1-Dichloroethane	<5.6	ug/kg	50.0	5.6	1	04/01/19 10:21	04/01/19 14:40	75-34-3	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

Sample: Trip Blank **Lab ID: 10468888006** Collected: 03/29/19 00:00 Received: 03/29/19 14:20 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,2-Dichloroethane	<5.5	ug/kg	50.0	5.5	1	04/01/19 10:21	04/01/19 14:40	107-06-2	
1,1-Dichloroethene	<15.0	ug/kg	50.0	15.0	1	04/01/19 10:21	04/01/19 14:40	75-35-4	
cis-1,2-Dichloroethene	<8.3	ug/kg	50.0	8.3	1	04/01/19 10:21	04/01/19 14:40	156-59-2	
trans-1,2-Dichloroethene	<23.4	ug/kg	50.0	23.4	1	04/01/19 10:21	04/01/19 14:40	156-60-5	
Dichlorofluoromethane	<69.1	ug/kg	500	69.1	1	04/01/19 10:21	04/01/19 14:40	75-43-4	N2
1,2-Dichloropropane	<8.6	ug/kg	50.0	8.6	1	04/01/19 10:21	04/01/19 14:40	78-87-5	
1,3-Dichloropropane	<6.9	ug/kg	50.0	6.9	1	04/01/19 10:21	04/01/19 14:40	142-28-9	
2,2-Dichloropropane	<6.2	ug/kg	200	6.2	1	04/01/19 10:21	04/01/19 14:40	594-20-7	
1,1-Dichloropropene	<23.1	ug/kg	50.0	23.1	1	04/01/19 10:21	04/01/19 14:40	563-58-6	
cis-1,3-Dichloropropene	<7.2	ug/kg	50.0	7.2	1	04/01/19 10:21	04/01/19 14:40	10061-01-5	
trans-1,3-Dichloropropene	<7.0	ug/kg	50.0	7.0	1	04/01/19 10:21	04/01/19 14:40	10061-02-6	
Diethyl ether (Ethyl ether)	<30.6	ug/kg	200	30.6	1	04/01/19 10:21	04/01/19 14:40	60-29-7	
Ethylbenzene	<2.7	ug/kg	50.0	2.7	1	04/01/19 10:21	04/01/19 14:40	100-41-4	
Hexachloro-1,3-butadiene	<12.2	ug/kg	250	12.2	1	04/01/19 10:21	04/01/19 14:40	87-68-3	
Isopropylbenzene (Cumene)	<2.2	ug/kg	50.0	2.2	1	04/01/19 10:21	04/01/19 14:40	98-82-8	
p-Isopropyltoluene	<15.2	ug/kg	50.0	15.2	1	04/01/19 10:21	04/01/19 14:40	99-87-6	
Methylene Chloride	<94.1	ug/kg	200	94.1	1	04/01/19 10:21	04/01/19 14:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	<10.4	ug/kg	250	10.4	1	04/01/19 10:21	04/01/19 14:40	108-10-1	
Methyl-tert-butyl ether	<6.0	ug/kg	50.0	6.0	1	04/01/19 10:21	04/01/19 14:40	1634-04-4	
Naphthalene	<46.8	ug/kg	200	46.8	1	04/01/19 10:21	04/01/19 14:40	91-20-3	
n-Propylbenzene	<2.7	ug/kg	50.0	2.7	1	04/01/19 10:21	04/01/19 14:40	103-65-1	
Styrene	<2.3	ug/kg	50.0	2.3	1	04/01/19 10:21	04/01/19 14:40	100-42-5	
1,1,1,2-Tetrachloroethane	<15.7	ug/kg	50.0	15.7	1	04/01/19 10:21	04/01/19 14:40	630-20-6	
1,1,2,2-Tetrachloroethane	<8.8	ug/kg	50.0	8.8	1	04/01/19 10:21	04/01/19 14:40	79-34-5	
Tetrachloroethene	<17.6	ug/kg	50.0	17.6	1	04/01/19 10:21	04/01/19 14:40	127-18-4	
Tetrahydrofuran	<72.7	ug/kg	2000	72.7	1	04/01/19 10:21	04/01/19 14:40	109-99-9	
Toluene	<12.2	ug/kg	50.0	12.2	1	04/01/19 10:21	04/01/19 14:40	108-88-3	
1,2,3-Trichlorobenzene	<8.0	ug/kg	50.0	8.0	1	04/01/19 10:21	04/01/19 14:40	87-61-6	
1,2,4-Trichlorobenzene	<11.1	ug/kg	50.0	11.1	1	04/01/19 10:21	04/01/19 14:40	120-82-1	
1,1,1-Trichloroethane	<23.3	ug/kg	50.0	23.3	1	04/01/19 10:21	04/01/19 14:40	71-55-6	
1,1,2-Trichloroethane	<6.0	ug/kg	50.0	6.0	1	04/01/19 10:21	04/01/19 14:40	79-00-5	
Trichloroethene	<7.7	ug/kg	50.0	7.7	1	04/01/19 10:21	04/01/19 14:40	79-01-6	
Trichlorofluoromethane	<87.2	ug/kg	200	87.2	1	04/01/19 10:21	04/01/19 14:40	75-69-4	
1,2,3-Trichloropropane	<13.1	ug/kg	200	13.1	1	04/01/19 10:21	04/01/19 14:40	96-18-4	
1,1,2-Trichlorotrifluoroethane	<58.0	ug/kg	200	58.0	1	04/01/19 10:21	04/01/19 14:40	76-13-1	
1,2,4-Trimethylbenzene	<10.0	ug/kg	50.0	10.0	1	04/01/19 10:21	04/01/19 14:40	95-63-6	
1,3,5-Trimethylbenzene	<8.0	ug/kg	50.0	8.0	1	04/01/19 10:21	04/01/19 14:40	108-67-8	
Vinyl chloride	<9.8	ug/kg	20.0	9.8	1	04/01/19 10:21	04/01/19 14:40	75-01-4	
Xylene (Total)	<11.6	ug/kg	150	11.6	1	04/01/19 10:21	04/01/19 14:40	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%	75-125		1	04/01/19 10:21	04/01/19 14:40	17060-07-0	
Toluene-d8 (S)	95	%	75-125		1	04/01/19 10:21	04/01/19 14:40	2037-26-5	
4-Bromofluorobenzene (S)	93	%	75-125		1	04/01/19 10:21	04/01/19 14:40	460-00-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 598246

Analysis Method: WI MOD GRO

QC Batch Method: EPA 5030 Medium Soil

Analysis Description: WIGRO Solid GCV

Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005, 10468888006

METHOD BLANK: 3234580

Matrix: Solid

Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005, 10468888006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	<1.3	10.0	1.3	04/09/19 13:41	
a,a,a-Trifluorotoluene (S)	%.	100	80-150		04/09/19 13:41	

LABORATORY CONTROL SAMPLE & LCSD: 3234581

3234582

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	44.1	43.9	88	88	80-120	0	20	
a,a,a-Trifluorotoluene (S)	%.				98	98	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3235289

3235290

Parameter	Units	10468902001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	ND	51.3	54.4	54.7	62.0	101	108	80-120	12	20	
a,a,a-Trifluorotoluene (S)	%.						101	96	80-150			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 596720

Analysis Method: EPA 7471B

QC Batch Method: EPA 7471B

Analysis Description: 7471B Mercury Solids

Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

METHOD BLANK: 3227068

Matrix: Solid

Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0071	0.018	0.0071	04/03/19 11:19	

LABORATORY CONTROL SAMPLE: 3227069

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.47	0.49	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227070 3227071

Parameter	Units	10468835007		3227071		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Mercury	mg/kg	0.045	0.52	0.52	0.59	105	112	80-120	6	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 596714

Analysis Method: EPA 6010D

QC Batch Method: EPA 3050

Analysis Description: 6010D Solids

Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

METHOD BLANK: 3227044

Matrix: Solid

Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	mg/kg	<0.038	0.45	0.038	04/02/19 12:29	
Silver	mg/kg	<0.033	0.45	0.033	04/02/19 12:29	

LABORATORY CONTROL SAMPLE: 3227045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/kg	49.5	49.9	101	80-120	
Silver	mg/kg	24.8	24.2	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227046 3227047

Parameter	Units	10468888001		3227046		3227047		% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Barium	mg/kg	57.4	57.7	55.5	116	125	102	122	75-125	7	20	
Silver	mg/kg	<0.041	28.8	27.7	25.1	24.6	87	89	75-125	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 596717 Analysis Method: EPA 6020B
QC Batch Method: EPA 3050 Analysis Description: 6020B Solids UPD5
Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

METHOD BLANK: 3227056 Matrix: Solid
Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.17	0.47	0.17	04/05/19 02:19	
Cadmium	mg/kg	<0.025	0.075	0.025	04/05/19 02:19	
Chromium	mg/kg	<0.12	0.47	0.12	04/05/19 02:19	
Lead	mg/kg	<0.054	0.19	0.054	04/05/19 02:19	
Selenium	mg/kg	<0.14	0.47	0.14	04/05/19 02:19	

LABORATORY CONTROL SAMPLE: 3227057

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	50.1	100	80-120	
Cadmium	mg/kg	50	53.5	107	80-120	
Chromium	mg/kg	50	54.3	109	80-120	
Lead	mg/kg	50	53.2	106	80-120	
Selenium	mg/kg	50	51.2	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227058 3227059

Parameter	Units	10468835005		3227058		3227059		% Rec	% Rec	% Rec	Max	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result					
Arsenic	mg/kg	1.8	53.5	55	50.1	55.9	90	98	75-125	11	20	
Cadmium	mg/kg	ND	53.5	55	51.2	58.7	96	107	75-125	14	20	
Chromium	mg/kg	28.0	53.5	55	72.6	77.8	83	91	75-125	7	20	
Lead	mg/kg	3.0	53.5	55	53.0	59.5	94	103	75-125	12	20	
Selenium	mg/kg	ND	53.5	55	48.7	55.6	90	100	75-125	13	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 596785

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10468888001, 10468888002

SAMPLE DUPLICATE: 3227344

Parameter	Units	10468884008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.2	13.4	2	30	

SAMPLE DUPLICATE: 3227478

Parameter	Units	10468886005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	9.5	8.9	7	30	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 596786

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10468888003, 10468888004, 10468888005

SAMPLE DUPLICATE: 3227255

Parameter	Units	10468888003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.0	13.1	1	30	

SAMPLE DUPLICATE: 3227256

Parameter	Units	10468902003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	20.4	20.4	0	30	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 596792 Analysis Method: EPA 8260B
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005, 10468888006

METHOD BLANK: 3227293 Matrix: Solid
Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005, 10468888006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	<15.7	50.0	15.7	04/01/19 13:10	
1,1,1-Trichloroethane	ug/kg	<23.3	50.0	23.3	04/01/19 13:10	
1,1,2,2-Tetrachloroethane	ug/kg	<8.8	50.0	8.8	04/01/19 13:10	
1,1,2-Trichloroethane	ug/kg	<6.0	50.0	6.0	04/01/19 13:10	
1,1,2-Trichlorotrifluoroethane	ug/kg	<58.0	200	58.0	04/01/19 13:10	
1,1-Dichloroethane	ug/kg	<5.6	50.0	5.6	04/01/19 13:10	
1,1-Dichloroethene	ug/kg	<15.0	50.0	15.0	04/01/19 13:10	
1,1-Dichloropropene	ug/kg	<23.1	50.0	23.1	04/01/19 13:10	
1,2,3-Trichlorobenzene	ug/kg	<8.0	50.0	8.0	04/01/19 13:10	
1,2,3-Trichloropropane	ug/kg	<13.1	200	13.1	04/01/19 13:10	
1,2,4-Trichlorobenzene	ug/kg	<11.1	50.0	11.1	04/01/19 13:10	
1,2,4-Trimethylbenzene	ug/kg	<10.0	50.0	10.0	04/01/19 13:10	
1,2-Dibromo-3-chloropropane	ug/kg	<174	500	174	04/01/19 13:10	
1,2-Dibromoethane (EDB)	ug/kg	<5.3	50.0	5.3	04/01/19 13:10	
1,2-Dichlorobenzene	ug/kg	<2.0	50.0	2.0	04/01/19 13:10	
1,2-Dichloroethane	ug/kg	<5.5	50.0	5.5	04/01/19 13:10	
1,2-Dichloropropane	ug/kg	<8.6	50.0	8.6	04/01/19 13:10	
1,3,5-Trimethylbenzene	ug/kg	<8.0	50.0	8.0	04/01/19 13:10	
1,3-Dichlorobenzene	ug/kg	<1.8	50.0	1.8	04/01/19 13:10	
1,3-Dichloropropane	ug/kg	<6.9	50.0	6.9	04/01/19 13:10	
1,4-Dichlorobenzene	ug/kg	<3.1	50.0	3.1	04/01/19 13:10	
2,2-Dichloropropane	ug/kg	<6.2	200	6.2	04/01/19 13:10	
2-Butanone (MEK)	ug/kg	<26.6	250	26.6	04/01/19 13:10	
2-Chlorotoluene	ug/kg	<2.5	50.0	2.5	04/01/19 13:10	
4-Chlorotoluene	ug/kg	<2.6	50.0	2.6	04/01/19 13:10	
4-Methyl-2-pentanone (MIBK)	ug/kg	<10.4	250	10.4	04/01/19 13:10	
Acetone	ug/kg	<311	1000	311	04/01/19 13:10	
Allyl chloride	ug/kg	<41.9	200	41.9	04/01/19 13:10	
Benzene	ug/kg	<2.8	20.0	2.8	04/01/19 13:10	
Bromobenzene	ug/kg	<3.1	50.0	3.1	04/01/19 13:10	
Bromochloromethane	ug/kg	<17.3	50.0	17.3	04/01/19 13:10	
Bromodichloromethane	ug/kg	<17.1	50.0	17.1	04/01/19 13:10	
Bromoform	ug/kg	<75.7	200	75.7	04/01/19 13:10	
Bromomethane	ug/kg	<58.5	500	58.5	04/01/19 13:10	
Carbon tetrachloride	ug/kg	<23.9	50.0	23.9	04/01/19 13:10	
Chlorobenzene	ug/kg	<2.8	50.0	2.8	04/01/19 13:10	
Chloroethane	ug/kg	<26.0	500	26.0	04/01/19 13:10	
Chloroform	ug/kg	<25.0	50.0	25.0	04/01/19 13:10	
Chloromethane	ug/kg	<12.0	200	12.0	04/01/19 13:10	
cis-1,2-Dichloroethene	ug/kg	<8.3	50.0	8.3	04/01/19 13:10	
cis-1,3-Dichloropropene	ug/kg	<7.2	50.0	7.2	04/01/19 13:10	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

METHOD BLANK: 3227293

Matrix: Solid

Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005, 10468888006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	<5.8	200	5.8	04/01/19 13:10	
Dibromomethane	ug/kg	<9.2	50.0	9.2	04/01/19 13:10	
Dichlorodifluoromethane	ug/kg	<16.2	200	16.2	04/01/19 13:10	
Dichlorofluoromethane	ug/kg	<69.1	500	69.1	04/01/19 13:10	N2
Diethyl ether (Ethyl ether)	ug/kg	<30.6	200	30.6	04/01/19 13:10	
Ethylbenzene	ug/kg	<2.7	50.0	2.7	04/01/19 13:10	
Hexachloro-1,3-butadiene	ug/kg	<12.2	250	12.2	04/01/19 13:10	
Isopropylbenzene (Cumene)	ug/kg	<2.2	50.0	2.2	04/01/19 13:10	
Methyl-tert-butyl ether	ug/kg	<6.0	50.0	6.0	04/01/19 13:10	
Methylene Chloride	ug/kg	<94.1	200	94.1	04/01/19 13:10	
n-Butylbenzene	ug/kg	<23.8	50.0	23.8	04/01/19 13:10	
n-Propylbenzene	ug/kg	<2.7	50.0	2.7	04/01/19 13:10	
Naphthalene	ug/kg	<46.8	200	46.8	04/01/19 13:10	
p-Isopropyltoluene	ug/kg	<15.2	50.0	15.2	04/01/19 13:10	
sec-Butylbenzene	ug/kg	<9.6	50.0	9.6	04/01/19 13:10	
Styrene	ug/kg	<2.3	50.0	2.3	04/01/19 13:10	
tert-Butylbenzene	ug/kg	<9.6	50.0	9.6	04/01/19 13:10	
Tetrachloroethene	ug/kg	<17.6	50.0	17.6	04/01/19 13:10	
Tetrahydrofuran	ug/kg	<72.7	2000	72.7	04/01/19 13:10	
Toluene	ug/kg	<12.2	50.0	12.2	04/01/19 13:10	
trans-1,2-Dichloroethene	ug/kg	<23.4	50.0	23.4	04/01/19 13:10	
trans-1,3-Dichloropropene	ug/kg	<7.0	50.0	7.0	04/01/19 13:10	
Trichloroethene	ug/kg	<7.7	50.0	7.7	04/01/19 13:10	
Trichlorofluoromethane	ug/kg	<87.2	200	87.2	04/01/19 13:10	
Vinyl chloride	ug/kg	<9.8	20.0	9.8	04/01/19 13:10	
Xylene (Total)	ug/kg	<11.6	150	11.6	04/01/19 13:10	
1,2-Dichloroethane-d4 (S)	%	91	75-125		04/01/19 13:10	
4-Bromofluorobenzene (S)	%	91	75-125		04/01/19 13:10	
Toluene-d8 (S)	%	97	75-125		04/01/19 13:10	

LABORATORY CONTROL SAMPLE: 3227294

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	797	80	53-125	
1,1,1-Trichloroethane	ug/kg	1000	721	72	53-146	
1,1,2,2-Tetrachloroethane	ug/kg	1000	668	67	51-125	
1,1,2-Trichloroethane	ug/kg	1000	791	79	55-125	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	937	94	49-150	
1,1-Dichloroethane	ug/kg	1000	702	70	56-125	
1,1-Dichloroethene	ug/kg	1000	883	88	48-148	
1,1-Dichloropropene	ug/kg	1000	750	75	55-142	
1,2,3-Trichlorobenzene	ug/kg	1000	762	76	47-125	
1,2,3-Trichloropropane	ug/kg	1000	740	74	52-125	
1,2,4-Trichlorobenzene	ug/kg	1000	728	73	48-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

LABORATORY CONTROL SAMPLE: 3227294

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	758	76	51-126	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1530	61	50-125	
1,2-Dibromoethane (EDB)	ug/kg	1000	801	80	52-125	
1,2-Dichlorobenzene	ug/kg	1000	760	76	50-125	
1,2-Dichloroethane	ug/kg	1000	720	72	51-125	
1,2-Dichloropropane	ug/kg	1000	766	77	57-125	
1,3,5-Trimethylbenzene	ug/kg	1000	750	75	52-127	
1,3-Dichlorobenzene	ug/kg	1000	768	77	50-128	
1,3-Dichloropropane	ug/kg	1000	752	75	55-125	
1,4-Dichlorobenzene	ug/kg	1000	754	75	51-125	
2,2-Dichloropropane	ug/kg	1000	706	71	41-136	
2-Butanone (MEK)	ug/kg	5000	2900	58	43-125	
2-Chlorotoluene	ug/kg	1000	728	73	52-126	
4-Chlorotoluene	ug/kg	1000	713	71	53-126	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	3400	68	39-125	
Acetone	ug/kg	5000	4360	87	46-136	
Allyl chloride	ug/kg	1000	700	70	48-130	
Benzene	ug/kg	1000	713	71	48-125	
Bromobenzene	ug/kg	1000	770	77	51-125	
Bromochloromethane	ug/kg	1000	754	75	52-125	
Bromodichloromethane	ug/kg	1000	755	75	51-131	
Bromoform	ug/kg	1000	749	75	52-125	
Bromomethane	ug/kg	1000	985	99	30-150	
Carbon tetrachloride	ug/kg	1000	760	76	59-129	
Chlorobenzene	ug/kg	1000	787	79	54-125	
Chloroethane	ug/kg	1000	1150	115	61-132	CH
Chloroform	ug/kg	1000	735	74	52-125	
Chloromethane	ug/kg	1000	689	69	46-125	
cis-1,2-Dichloroethene	ug/kg	1000	712	71	54-127	
cis-1,3-Dichloropropene	ug/kg	1000	740	74	50-134	
Dibromochloromethane	ug/kg	1000	762	76	54-125	
Dibromomethane	ug/kg	1000	807	81	51-125	
Dichlorodifluoromethane	ug/kg	1000	596	60	42-125	
Dichlorofluoromethane	ug/kg	1000	1050	105	30-150	N2
Diethyl ether (Ethyl ether)	ug/kg	1000	803	80	50-127	
Ethylbenzene	ug/kg	1000	778	78	51-125	
Hexachloro-1,3-butadiene	ug/kg	1000	864	86	41-133	
Isopropylbenzene (Cumene)	ug/kg	1000	807	81	54-134	
Methyl-tert-butyl ether	ug/kg	1000	646	65	53-125	
Methylene Chloride	ug/kg	1000	710	71	48-125	
n-Butylbenzene	ug/kg	1000	804	80	49-135	
n-Propylbenzene	ug/kg	1000	762	76	55-129	
Naphthalene	ug/kg	1000	681	68	51-125	
p-Isopropyltoluene	ug/kg	1000	829	83	53-134	
sec-Butylbenzene	ug/kg	1000	801	80	52-134	
Styrene	ug/kg	1000	759	76	53-128	
tert-Butylbenzene	ug/kg	1000	763	76	51-133	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

LABORATORY CONTROL SAMPLE: 3227294

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tetrachloroethane	ug/kg	1000	842	84	54-131	
Tetrahydrofuran	ug/kg	10000	8820	88	42-145	
Toluene	ug/kg	1000	787	79	51-125	
trans-1,2-Dichloroethene	ug/kg	1000	714	71	50-130	
trans-1,3-Dichloropropene	ug/kg	1000	751	75	52-125	
Trichloroethene	ug/kg	1000	868	87	55-131	
Trichlorofluoromethane	ug/kg	1000	1360	136	30-150	CH
Vinyl chloride	ug/kg	1000	772	77	58-125	
Xylene (Total)	ug/kg	3000	2370	79	52-125	
1,2-Dichloroethane-d4 (S)	%			84	75-125	
4-Bromofluorobenzene (S)	%			90	75-125	
Toluene-d8 (S)	%			97	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227295 3227296

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10468888001 Result	Spike Conc.	Spike Conc.	MS Result						
1,1,1,2-Tetrachloroethane	ug/kg	<17.8	1270	1200	1440	1350	113	112	68-150	6	30
1,1,1-Trichloroethane	ug/kg	<26.4	1270	1200	1320	1190	104	100	63-150	10	30
1,1,2,2-Tetrachloroethane	ug/kg	<10	1270	1200	1190	1150	94	96	60-146	3	30
1,1,2-Trichloroethane	ug/kg	<6.8	1270	1200	1380	1270	109	106	63-143	8	30
1,1,2-Trichlorotrifluoroethane	ug/kg	<65.7	1270	1200	1570	1410	124	118	30-150	10	30
1,1-Dichloroethane	ug/kg	<6.4	1270	1200	1200	1100	95	92	63-144	9	30
1,1-Dichloroethene	ug/kg	<17.0	1270	1200	1440	1320	114	110	30-150	9	30
1,1-Dichloropropene	ug/kg	<26.2	1270	1200	1320	1210	104	101	54-150	8	30
1,2,3-Trichlorobenzene	ug/kg	<9.1	1270	1200	1360	1290	107	108	63-142	5	30
1,2,3-Trichloropropane	ug/kg	<14.8	1270	1200	1340	1240	106	104	59-147	8	30
1,2,4-Trichlorobenzene	ug/kg	<12.6	1270	1200	1410	1270	111	106	66-142	10	30
1,2,4-Trimethylbenzene	ug/kg	<11.3	1270	1200	1350	1260	107	105	65-145	7	30
1,2-Dibromo-3-chloropropane	ug/kg	<197	3160	2990	2910	2820	92	94	60-142	3	30
1,2-Dibromoethane (EDB)	ug/kg	<6.0	1270	1200	1380	1310	109	109	67-135	6	30
1,2-Dichlorobenzene	ug/kg	<2.3	1270	1200	1320	1240	105	104	68-141	6	30
1,2-Dichloroethane	ug/kg	<6.2	1270	1200	1240	1160	98	97	56-132	7	30
1,2-Dichloropropane	ug/kg	<9.8	1270	1200	1360	1240	108	103	58-150	10	30
1,3,5-Trimethylbenzene	ug/kg	<9.0	1270	1200	1350	1240	107	104	66-148	9	30
1,3-Dichlorobenzene	ug/kg	<2.1	1270	1200	1370	1280	108	107	63-148	7	30
1,3-Dichloropropane	ug/kg	<7.8	1270	1200	1350	1270	107	106	63-142	6	30
1,4-Dichlorobenzene	ug/kg	<3.5	1270	1200	1360	1250	107	105	68-140	8	30
2,2-Dichloropropane	ug/kg	<7.1	1270	1200	1260	1130	99	95	62-143	10	30
2-Butanone (MEK)	ug/kg	<30.1	6320	5990	5690	6020	90	101	53-138	6	30
2-Chlorotoluene	ug/kg	<2.8	1270	1200	1290	1210	102	101	64-145	7	30
4-Chlorotoluene	ug/kg	<2.9	1270	1200	1280	1200	101	101	63-149	6	30
4-Methyl-2-pentanone (MIBK)	ug/kg	<11.8	6320	5990	6320	6150	100	103	47-150	3	30
Acetone	ug/kg	<353	6320	5990	8360	8700	132	145	64-150	4	30

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		3227295		3227296									
Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		1046888001	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Allyl chloride	ug/kg	<47.5	1270	1200	1140	1020	90	85	49-146	11	30		
Benzene	ug/kg	<3.2	1270	1200	1280	1160	101	97	63-136	10	30		
Bromobenzene	ug/kg	<3.5	1270	1200	1330	1280	105	107	63-142	4	30		
Bromochloromethane	ug/kg	<19.6	1270	1200	1340	1220	106	102	61-139	9	30		
Bromodichloromethane	ug/kg	<19.4	1270	1200	1390	1220	110	102	63-150	12	30		
Bromoform	ug/kg	<85.8	1270	1200	1370	1300	108	108	64-140	5	30		
Bromomethane	ug/kg	<66.3	1270	1200	1610	1430	127	119	56-148	12	30		
Carbon tetrachloride	ug/kg	<27.1	1270	1200	1330	1220	105	102	75-148	9	30		
Chlorobenzene	ug/kg	<3.2	1270	1200	1380	1280	109	107	62-147	7	30		
Chloroethane	ug/kg	<29.5	1270	1200	1870	1560	148	131	37-150	18	30	CH	
Chloroform	ug/kg	<28.3	1270	1200	1290	1180	102	99	66-130	9	30		
Chloromethane	ug/kg	<13.6	1270	1200	1070	919	85	77	35-131	15	30		
cis-1,2-Dichloroethene	ug/kg	<9.4	1270	1200	1250	1140	99	95	63-143	10	30		
cis-1,3-Dichloropropene	ug/kg	<8.1	1270	1200	1350	1200	107	100	60-150	12	30		
Dibromochloromethane	ug/kg	<6.6	1270	1200	1400	1300	111	109	64-144	7	30		
Dibromomethane	ug/kg	<10.4	1270	1200	1430	1300	113	108	59-148	10	30		
Dichlorodifluoromethane	ug/kg	<18.4	1270	1200	807	682	64	57	30-125	17	30		
Dichlorofluoromethane	ug/kg	<78.3	1270	1200	1740	1500	138	126	39-150	15	30	N2	
Diethyl ether (Ethyl ether)	ug/kg	<34.7	1270	1200	1410	1290	111	107	59-149	9	30		
Ethylbenzene	ug/kg	<3.1	1270	1200	1400	1320	111	110	64-142	6	30		
Hexachloro-1,3-butadiene	ug/kg	<13.8	1270	1200	1680	1500	132	126	58-150	11	30		
Isopropylbenzene (Cumene)	ug/kg	<2.5	1270	1200	1440	1360	114	113	67-150	6	30		
Methyl-tert-butyl ether	ug/kg	<6.7	1270	1200	1150	1100	91	92	69-134	4	30		
Methylene Chloride	ug/kg	<107	1270	1200	1220	1100	96	92	56-134	10	30		
n-Butylbenzene	ug/kg	<27.0	1270	1200	1450	1340	115	112	64-150	9	30		
n-Propylbenzene	ug/kg	<3.0	1270	1200	1360	1270	107	106	65-150	7	30		
Naphthalene	ug/kg	<53.0	1270	1200	1290	1250	101	103	63-148	3	30		
p-Isopropyltoluene	ug/kg	<17.2	1270	1200	1480	1340	117	112	69-150	9	30		
sec-Butylbenzene	ug/kg	<10.9	1270	1200	1450	1330	114	111	69-150	9	30		
Styrene	ug/kg	<2.6	1270	1200	1360	1280	108	107	63-150	6	30		
tert-Butylbenzene	ug/kg	<10.9	1270	1200	1380	1280	109	107	67-150	7	30		
Tetrachloroethene	ug/kg	<19.9	1270	1200	1520	1400	120	117	62-150	8	30		
Tetrahydrofuran	ug/kg	<82.4	12700	12000	16000	15000	127	126	53-150	7	30		
Toluene	ug/kg	<13.8	1270	1200	1400	1320	111	110	61-141	6	30		
trans-1,2-Dichloroethene	ug/kg	<26.5	1270	1200	1240	1100	98	92	52-148	12	30		
trans-1,3-Dichloropropene	ug/kg	<7.9	1270	1200	1350	1250	107	105	62-142	8	30		
Trichloroethene	ug/kg	<8.7	1270	1200	1540	1400	122	117	59-150	10	30		
Trichlorofluoromethane	ug/kg	<98.8	1270	1200	2230	1850	176	155	30-150	18	30	CH,M1	
Vinyl chloride	ug/kg	<11.2	1270	1200	1250	1070	99	89	44-144	16	30		
Xylene (Total)	ug/kg	<13.1	3800	3590	4250	3970	112	111	67-145	7	30		
1,2-Dichloroethane-d4 (S)	%						86	86	75-125				
4-Bromofluorobenzene (S)	%						90	90	75-125				
Toluene-d8 (S)	%						97	98	75-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 596780 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

METHOD BLANK: 3227240 Matrix: Solid
Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/kg	<0.41	10.0	0.41	04/02/19 11:25	
Acenaphthylene	ug/kg	<0.50	10.0	0.50	04/02/19 11:25	
Anthracene	ug/kg	<0.47	10.0	0.47	04/02/19 11:25	
Benzo(a)anthracene	ug/kg	<1.1	10.0	1.1	04/02/19 11:25	
Benzo(a)pyrene	ug/kg	<0.69	10.0	0.69	04/02/19 11:25	
Benzo(b)fluoranthene	ug/kg	<0.37	10.0	0.37	04/02/19 11:25	
Benzo(e)pyrene	ug/kg	<0.72	10.0	0.72	04/02/19 11:25	N2
Benzo(g,h,i)perylene	ug/kg	<0.63	10.0	0.63	04/02/19 11:25	
Benzo(k)fluoranthene	ug/kg	<0.84	10.0	0.84	04/02/19 11:25	
Chrysene	ug/kg	<1.4	10.0	1.4	04/02/19 11:25	
Dibenz(a,h)anthracene	ug/kg	<0.46	10.0	0.46	04/02/19 11:25	
Fluoranthene	ug/kg	<0.43	10.0	0.43	04/02/19 11:25	
Fluorene	ug/kg	<0.31	10.0	0.31	04/02/19 11:25	
Indeno(1,2,3-cd)pyrene	ug/kg	<0.67	10.0	0.67	04/02/19 11:25	
Naphthalene	ug/kg	<0.77	10.0	0.77	04/02/19 11:25	
Phenanthrene	ug/kg	<1.9	10.0	1.9	04/02/19 11:25	
Pyrene	ug/kg	<1.5	10.0	1.5	04/02/19 11:25	
2-Fluorobiphenyl (S)	%	88	30-125		04/02/19 11:25	
p-Terphenyl-d14 (S)	%	83	30-125		04/02/19 11:25	

LABORATORY CONTROL SAMPLE: 3227241

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	26.5	80	46-125	
Acenaphthylene	ug/kg	33.3	28.4	85	44-125	
Anthracene	ug/kg	33.3	28.4	85	62-125	
Benzo(a)anthracene	ug/kg	33.3	26.7	80	53-125	
Benzo(a)pyrene	ug/kg	33.3	28.4	85	62-125	
Benzo(b)fluoranthene	ug/kg	33.3	29.2	87	51-125	
Benzo(e)pyrene	ug/kg	33.3	30.0	90	64-125	N2
Benzo(g,h,i)perylene	ug/kg	33.3	28.4	85	58-125	
Benzo(k)fluoranthene	ug/kg	33.3	28.1	84	59-125	
Chrysene	ug/kg	33.3	27.9	84	59-125	
Dibenz(a,h)anthracene	ug/kg	33.3	28.3	85	60-125	
Fluoranthene	ug/kg	33.3	30.7	92	67-125	
Fluorene	ug/kg	33.3	28.6	86	51-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	29.1	87	59-125	
Naphthalene	ug/kg	33.3	27.3	82	47-125	
Phenanthrene	ug/kg	33.3	26.7	80	61-125	
Pyrene	ug/kg	33.3	28.9	87	52-125	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

LABORATORY CONTROL SAMPLE: 3227241

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Fluorobiphenyl (S)	%.			88	30-125	
p-Terphenyl-d14 (S)	%.			85	30-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227284 3227285

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10468906002 Result	Spike Conc.	Spike Conc.	MS Result						
Acenaphthene	ug/kg	ND	36.3	36.3	32.9	33.8	91	93	30-125	3	30
Acenaphthylene	ug/kg	109	36.3	36.3	121	75.5	34	-92	30-125	46	30 M1,R1
Anthracene	ug/kg	56.6	36.3	36.3	88.2	73.3	87	46	30-131	18	30
Benzo(a)anthracene	ug/kg	143	36.3	36.3	145	105	6	-105	30-126	32	30 M1,R1
Benzo(a)pyrene	ug/kg	169	36.3	36.3	159	101	-28	-189	30-150	45	30 M1,R1
Benzo(b)fluoranthene	ug/kg	222	36.3	36.3	222	132	1	-247	30-150	51	30 M1,R1
Benzo(e)pyrene	ug/kg	129	36.3	36.3	131	83.2	6	-127	30-150	45	30 M1,N2,R1
Benzo(g,h,i)perylene	ug/kg	226	36.3	36.3	212	126	-38	-274	30-150	51	30 M1,R1
Benzo(k)fluoranthene	ug/kg	78.9	36.3	36.3	83.6	105	13	73	30-150	23	30 M1
Chrysene	ug/kg	117	36.3	36.3	124	85.0	21	-87	30-150	37	30 M1,R1
Dibenz(a,h)anthracene	ug/kg	41.7	36.3	36.3	64.9	45.1	64	9	30-143	36	30 M1,R1
Fluoranthene	ug/kg	196	36.3	36.3	211	150	43	-126	30-143	34	30 M1,R1
Fluorene	ug/kg	ND	36.3	36.3	36.6	39.1	101	108	30-138	7	30
Indeno(1,2,3-cd)pyrene	ug/kg	147	36.3	36.3	144	88.4	-7	-161	30-150	48	30 M1,R1
Naphthalene	ug/kg	ND	36.3	36.3	34.3	30.4	95	84	30-125	12	30
Phenanthrene	ug/kg	66.0	36.3	36.3	96.7	97.4	85	87	30-142	1	30
Pyrene	ug/kg	178	36.3	36.3	179	124	3	-149	30-149	36	30 M1,R1
2-Fluorobiphenyl (S)	%.						84	84	30-125		
p-Terphenyl-d14 (S)	%.						77	82	30-125		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

QC Batch: 596751 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

METHOD BLANK: 3227167 Matrix: Solid
Associated Lab Samples: 10468888001, 10468888002, 10468888003, 10468888004, 10468888005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	<2.6	10.0	2.6	04/02/19 16:03	
n-Triacontane (S)	%.	86	50-150		04/02/19 16:03	

LABORATORY CONTROL SAMPLE & LCSD: 3227168

Parameter	Units	3227169								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
WDRO C10-C28	mg/kg	80	71.3	73.5	89	92	70-120	3	20	
n-Triacontane (S)	%.				88	85	50-150			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10468888

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

D4 Sample was diluted due to the presence of high levels of target analytes.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

R1 RPD value was outside control limits.

S4 Surrogate recovery not evaluated against control limits due to sample dilution.

T6 High boiling point hydrocarbons are present in the sample.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10468888

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10468888001	FD-SB-F2 (0-6ft)	WI MOD DRO	596751	WI MOD DRO	597331
10468888002	FD-SB-G5 (0-6ft)	WI MOD DRO	596751	WI MOD DRO	597331
10468888003	FD-SB-C3 (0-4.5ft)	WI MOD DRO	596751	WI MOD DRO	597331
10468888004	FD-SB-A4 (0-3ft)	WI MOD DRO	596751	WI MOD DRO	597331
10468888005	FD-SB-B1 (0-7.5ft)	WI MOD DRO	596751	WI MOD DRO	597331
10468888001	FD-SB-F2 (0-6ft)	EPA 5030 Medium Soil	598246	WI MOD GRO	598392
10468888002	FD-SB-G5 (0-6ft)	EPA 5030 Medium Soil	598246	WI MOD GRO	598392
10468888003	FD-SB-C3 (0-4.5ft)	EPA 5030 Medium Soil	598246	WI MOD GRO	598392
10468888004	FD-SB-A4 (0-3ft)	EPA 5030 Medium Soil	598246	WI MOD GRO	598392
10468888005	FD-SB-B1 (0-7.5ft)	EPA 5030 Medium Soil	598246	WI MOD GRO	598392
10468888006	Trip Blank	EPA 5030 Medium Soil	598246	WI MOD GRO	598392
10468888001	FD-SB-F2 (0-6ft)	EPA 3050	596714	EPA 6010D	597016
10468888002	FD-SB-G5 (0-6ft)	EPA 3050	596714	EPA 6010D	597016
10468888003	FD-SB-C3 (0-4.5ft)	EPA 3050	596714	EPA 6010D	597016
10468888004	FD-SB-A4 (0-3ft)	EPA 3050	596714	EPA 6010D	597016
10468888005	FD-SB-B1 (0-7.5ft)	EPA 3050	596714	EPA 6010D	597016
10468888001	FD-SB-F2 (0-6ft)	EPA 3050	596717	EPA 6020B	597085
10468888002	FD-SB-G5 (0-6ft)	EPA 3050	596717	EPA 6020B	597085
10468888003	FD-SB-C3 (0-4.5ft)	EPA 3050	596717	EPA 6020B	597085
10468888004	FD-SB-A4 (0-3ft)	EPA 3050	596717	EPA 6020B	597085
10468888005	FD-SB-B1 (0-7.5ft)	EPA 3050	596717	EPA 6020B	597085
10468888001	FD-SB-F2 (0-6ft)	EPA 7471B	596720	EPA 7471B	596969
10468888002	FD-SB-G5 (0-6ft)	EPA 7471B	596720	EPA 7471B	596969
10468888003	FD-SB-C3 (0-4.5ft)	EPA 7471B	596720	EPA 7471B	596969
10468888004	FD-SB-A4 (0-3ft)	EPA 7471B	596720	EPA 7471B	596969
10468888005	FD-SB-B1 (0-7.5ft)	EPA 7471B	596720	EPA 7471B	596969
10468888001	FD-SB-F2 (0-6ft)	ASTM D2974	596785		
10468888002	FD-SB-G5 (0-6ft)	ASTM D2974	596785		
10468888003	FD-SB-C3 (0-4.5ft)	ASTM D2974	596786		
10468888004	FD-SB-A4 (0-3ft)	ASTM D2974	596786		
10468888005	FD-SB-B1 (0-7.5ft)	ASTM D2974	596786		
10468888001	FD-SB-F2 (0-6ft)	EPA 3550	596780	EPA 8270D by SIM	597091
10468888002	FD-SB-G5 (0-6ft)	EPA 3550	596780	EPA 8270D by SIM	597091
10468888003	FD-SB-C3 (0-4.5ft)	EPA 3550	596780	EPA 8270D by SIM	597091
10468888004	FD-SB-A4 (0-3ft)	EPA 3550	596780	EPA 8270D by SIM	597091
10468888005	FD-SB-B1 (0-7.5ft)	EPA 3550	596780	EPA 8270D by SIM	597091
10468888001	FD-SB-F2 (0-6ft)	EPA 5035/5030B	596792	EPA 8260B	596837
10468888002	FD-SB-G5 (0-6ft)	EPA 5035/5030B	596792	EPA 8260B	596837
10468888003	FD-SB-C3 (0-4.5ft)	EPA 5035/5030B	596792	EPA 8260B	596837
10468888004	FD-SB-A4 (0-3ft)	EPA 5035/5030B	596792	EPA 8260B	596837
10468888005	FD-SB-B1 (0-7.5ft)	EPA 5035/5030B	596792	EPA 8260B	596837
10468888006	Trip Blank	EPA 5035/5030B	596792	EPA 8260B	596837

REPORT OF LABORATORY ANALYSIS

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Minnesota Pollution Control Agency

Chain-of-Custody Form revised 2013.0909

Work Order Number:

COC Type:

Page: / of /

Turnaround Time:

COC ID:

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: MNSW-057

Program Code (MDH Lab Only):

Lab Name:

Pace Analytical - Minneapolis, MN

Project Name: 19-01567 MPCA Freeway LF 2019 Soils/Solids

Project Task Code: PRJ07786

Address: 1700 SE Elm Street

Project Manager: Brad Jacobson

612-607-6375

EPIC PROFILE #: 38716 Line 1

Minneapolis

MN

55414

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe
AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wt=Ground=Groundwater
Wt=Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.			Lab Sample No.	#
													Metals 6020/6010 / Mercury 7471 - QAPP Table 3b	8260 MLS / GRO - QAPP Table 3b	8270 PAH / DRO - QAPP Analytical Table 3b		
FD-SB-F2 (C-6-F2) Sample		3/29/19	0900			G	SD		N		8	X	X	X	01	1	
FD-SB-E5 (C-6-F5) Sample		3/29/19	0930			G	SD		N		8	X	X	X	02	2	
FD-SB-C3 (C-4-S3) Sample		3/29/19	0950			G	SD		N		8	X	X	X	03	3	
FD-SB-A4 (C-3-F4) Sample		3/29/19	1015			G	SD		N		8	X	X	X	04	4	
FD-SB-B1 (C-7-S1) Sample		3/29/19	1040			G	SD		N		8	X	X	X	05	5	
TRIP BLANK		3/29/19							N						06	6	
									N								
									N								
									N								
									N								

WO#: 10468888



10468888

Sampled By: David Anderson / Chris Pelosi

Sampler's Signature: David Anderson

none

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	3/29/19/1420	[Signature]	3/29/19 1425
			1426

Sample Condition Upon Receipt Client Name: MPLA Project #: **WO# : 10468888**

Courier: Fed Ex UPS USPS Client
 Pace SpeeDee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: G87A9155100842 G87A9170600254 Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>1.8</u> °C	Average Corrected Temp (no temp blank only): <input type="checkbox"/>
Correction Factor: <u>me</u>	Cooler Temp Corrected w/temp blank: <u>1.8</u> °C	See Exceptions <input type="checkbox"/>

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: TZ 3/29/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Field Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. If no, write ID/ Date/Time on Container Below: <input type="checkbox"/> See Exception
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Matrix: <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12. Sample # <input type="checkbox"/> NaOH <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> See Exception
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> See Exception
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> See Exception
Trip Blank Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): <u>110518-3</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/01/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

April 17, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 03, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10469445001	FL-SB-01-(0-10ft)	Solid	04/02/19 09:25	04/03/19 16:04
10469445002	FL-SB-02 (0-6ft)	Solid	04/02/19 10:00	04/03/19 16:04
10469445003	FL-SB-03 (0-6.5ft)	Solid	04/02/19 10:25	04/03/19 16:04
10469445004	FL-SB-04 (0-2ft)	Solid	04/02/19 10:45	04/03/19 16:04
10469445005	FL-SB-05 (0-6.5ft)	Solid	04/02/19 11:15	04/03/19 16:04
10469445006	FL-SB-06 (0-4.5ft)	Solid	04/02/19 11:40	04/03/19 16:04
10469445007	FL-SB-07 (0-4.5ft)	Solid	04/02/19 12:20	04/03/19 16:04
10469445008	FL-SB-08 (0-5ft)	Solid	04/02/19 13:20	04/03/19 16:04
10469445009	FL-SB-09 (0-8ft)	Solid	04/02/19 14:30	04/03/19 16:04
10469445010	FL-SB-10 (0-25ft)	Solid	04/02/19 15:15	04/03/19 16:04
10469445011	FL-SB-11 (0-20ft)	Solid	04/02/19 16:00	04/03/19 16:04
10469445012	FL-SB-12 (0-10ft)	Solid	04/02/19 16:40	04/03/19 16:04
10469445013	FL-SB-13 (0-6ft)	Solid	04/02/19 17:10	04/03/19 16:04
10469445014	FL-SB-14 (0-10ft)	Solid	04/02/19 17:40	04/03/19 16:04
10469445015	Trip Blank	Solid	04/02/19 00:00	04/03/19 16:04

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10469445001	FL-SB-01-(0-10ft)	WI MOD DRO	JVM	2	PASI-M		
		WI MOD GRO	AJR	2	PASI-M		
		EPA 6010D	IP	2	PASI-M		
		EPA 6020B	RJS	5	PASI-M		
		EPA 7471B	WBS	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D by SIM	SNG	19	PASI-M		
		EPA 8260B	GDM	70	PASI-M		
		10469445002	FL-SB-02 (0-6ft)	WI MOD DRO	JVM	2	PASI-M
				WI MOD GRO	AJR	2	PASI-M
EPA 6010D	IP			2	PASI-M		
EPA 6020B	RJS			5	PASI-M		
EPA 7471B	WBS			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D by SIM	SNG			19	PASI-M		
EPA 8260B	GDM			70	PASI-M		
10469445003	FL-SB-03 (0-6.5ft)			WI MOD DRO	JVM	2	PASI-M
				WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M		
		EPA 6020B	RJS	5	PASI-M		
		EPA 7471B	WBS	1	PASI-M		
		ASTM D2974	JDL	1	PASI-M		
		EPA 8270D by SIM	SNG	19	PASI-M		
		EPA 8260B	GDM	70	PASI-M		
		10469445004	FL-SB-04 (0-2ft)	WI MOD DRO	JVM	2	PASI-M
				WI MOD GRO	AJR	2	PASI-M
EPA 6010D	IP			2	PASI-M		
EPA 6020B	RJS			5	PASI-M		
EPA 7471B	WBS			1	PASI-M		
ASTM D2974	JDL			1	PASI-M		
EPA 8270D by SIM	SNG			19	PASI-M		
EPA 8260B	GDM			70	PASI-M		
10469445005	FL-SB-05 (0-6.5ft)			WI MOD DRO	JVM	2	PASI-M
				WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M		
		EPA 6020B	RJS	5	PASI-M		
		EPA 7471B	WBS	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10469445006	FL-SB-06 (0-4.5ft)	ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		WI MOD DRO	JVM	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
10469445007	FL-SB-07 (0-4.5ft)	EPA 8260B	GDM	70	PASI-M
		WI MOD DRO	JVM	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		WI MOD DRO	ST1	2	PASI-M
10469445008	FL-SB-08 (0-5ft)	WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		WI MOD DRO	ST1	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M
10469445009	FL-SB-09 (0-8ft)	EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		WI MOD DRO	ST1	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
10469445010	FL-SB-10 (0-25ft)	ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		WI MOD DRO	ST1	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6010D	IP	2	PASI-M
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		EPA 9060 Modified	TJJ	4	PASI-G
10469445011	FL-SB-11 (0-20ft)	WI MOD DRO	ST1	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		EPA 9060 Modified	TJJ	4	PASI-G
10469445012	FL-SB-12 (0-10ft)	WI MOD DRO	ST1	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		EPA 9060 Modified	TJJ	4	PASI-G
10469445013	FL-SB-13 (0-6ft)	WI MOD DRO	ST1	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		EPA 9060 Modified	TJJ	4	PASI-G
10469445014	FL-SB-14 (0-10ft)	WI MOD DRO	ST1	2	PASI-M
		WI MOD GRO	AJR	2	PASI-M
		EPA 6010D	IP	2	PASI-M

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	RJS	5	PASI-M
		EPA 7471B	WBS	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	SNG	19	PASI-M
		EPA 8260B	GDM	70	PASI-M
		EPA 9060 Modified	TJJ	4	PASI-G
10469445015	Trip Blank	WI MOD GRO	AJR	2	PASI-M
		EPA 8260B	GDM	70	PASI-M

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-01-(0-10ft) **Lab ID: 10469445001** Collected: 04/02/19 09:25 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	53.7	mg/kg	17.3	4.5	2	04/04/19 08:23	04/05/19 14:07		T6
Surrogates									
n-Triacontane (S)	100	%	50-150		2	04/04/19 08:23	04/05/19 14:07	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.4	mg/kg	11.2	1.4	1	04/11/19 13:33	04/12/19 02:33		
Surrogates									
a,a,a-Trifluorotoluene (S)	98	%	80-150		1	04/11/19 13:33	04/12/19 02:33	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	63.7	mg/kg	0.55	0.045	1	04/05/19 11:58	04/09/19 13:04	7440-39-3	M1,R1
Silver	<0.040	mg/kg	0.55	0.040	1	04/05/19 11:58	04/09/19 13:04	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	3.6	mg/kg	0.56	0.20	20	04/05/19 11:58	04/15/19 23:29	7440-38-2	
Cadmium	0.21	mg/kg	0.089	0.030	20	04/05/19 11:58	04/15/19 23:29	7440-43-9	
Chromium	13.6	mg/kg	0.56	0.14	20	04/05/19 11:58	04/15/19 23:29	7440-47-3	
Lead	25.7	mg/kg	0.22	0.064	20	04/05/19 11:58	04/15/19 23:29	7439-92-1	M6
Selenium	0.85	mg/kg	0.56	0.16	20	04/05/19 11:58	04/15/19 23:29	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.025	mg/kg	0.021	0.0083	1	04/05/19 12:48	04/15/19 13:07	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	14.3	%	0.10	0.10	1		04/05/19 13:31		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	55.2J	ug/kg	58.1	2.4	5	04/04/19 09:08	04/05/19 17:59	83-32-9	
Acenaphthylene	53.8J	ug/kg	58.1	2.9	5	04/04/19 09:08	04/05/19 17:59	208-96-8	
Anthracene	259	ug/kg	58.1	2.7	5	04/04/19 09:08	04/05/19 17:59	120-12-7	
Benzo(a)anthracene	546	ug/kg	58.1	6.3	5	04/04/19 09:08	04/05/19 17:59	56-55-3	
Benzo(a)pyrene	506	ug/kg	58.1	4.0	5	04/04/19 09:08	04/05/19 17:59	50-32-8	
Benzo(b)fluoranthene	623	ug/kg	58.1	2.2	5	04/04/19 09:08	04/05/19 17:59	205-99-2	
Benzo(e)pyrene	340	ug/kg	58.1	4.2	5	04/04/19 09:08	04/05/19 17:59	192-97-2	N2
Benzo(g,h,i)perylene	298	ug/kg	58.1	3.7	5	04/04/19 09:08	04/05/19 17:59	191-24-2	
Benzo(k)fluoranthene	375	ug/kg	58.1	4.9	5	04/04/19 09:08	04/05/19 17:59	207-08-9	
Chrysene	565	ug/kg	58.1	7.9	5	04/04/19 09:08	04/05/19 17:59	218-01-9	
Dibenz(a,h)anthracene	94.8	ug/kg	58.1	2.7	5	04/04/19 09:08	04/05/19 17:59	53-70-3	
Fluoranthene	1450	ug/kg	58.1	2.5	5	04/04/19 09:08	04/05/19 17:59	206-44-0	
Fluorene	58.7	ug/kg	58.1	1.8	5	04/04/19 09:08	04/05/19 17:59	86-73-7	
Indeno(1,2,3-cd)pyrene	302	ug/kg	58.1	3.9	5	04/04/19 09:08	04/05/19 17:59	193-39-5	
Naphthalene	17.1J	ug/kg	58.1	4.5	5	04/04/19 09:08	04/05/19 17:59	91-20-3	
Phenanthrene	1060	ug/kg	58.1	11.2	5	04/04/19 09:08	04/05/19 17:59	85-01-8	
Pyrene	996	ug/kg	58.1	8.9	5	04/04/19 09:08	04/05/19 17:59	129-00-0	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-01-(0-10ft)** Lab ID: **10469445001** Collected: 04/02/19 09:25 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Surrogates									
2-Fluorobiphenyl (S)	72	%	30-125		5	04/04/19 09:08	04/05/19 17:59	321-60-8	
p-Terphenyl-d14 (S)	67	%	30-125		5	04/04/19 09:08	04/05/19 17:59	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<356	ug/kg	1140	356	1	04/04/19 12:06	04/04/19 15:27	67-64-1	
Allyl chloride	<48.0	ug/kg	229	48.0	1	04/04/19 12:06	04/04/19 15:27	107-05-1	
Benzene	4.1J	ug/kg	22.9	3.2	1	04/04/19 12:06	04/04/19 15:27	71-43-2	
Bromobenzene	<3.5	ug/kg	57.2	3.5	1	04/04/19 12:06	04/04/19 15:27	108-86-1	
Bromochloromethane	<19.8	ug/kg	57.2	19.8	1	04/04/19 12:06	04/04/19 15:27	74-97-5	
Bromodichloromethane	<19.6	ug/kg	57.2	19.6	1	04/04/19 12:06	04/04/19 15:27	75-27-4	
Bromoform	<86.6	ug/kg	229	86.6	1	04/04/19 12:06	04/04/19 15:27	75-25-2	
Bromomethane	<67.0	ug/kg	572	67.0	1	04/04/19 12:06	04/04/19 15:27	74-83-9	
2-Butanone (MEK)	<30.4	ug/kg	286	30.4	1	04/04/19 12:06	04/04/19 15:27	78-93-3	
n-Butylbenzene	<27.2	ug/kg	57.2	27.2	1	04/04/19 12:06	04/04/19 15:27	104-51-8	
sec-Butylbenzene	<11.0	ug/kg	57.2	11.0	1	04/04/19 12:06	04/04/19 15:27	135-98-8	
tert-Butylbenzene	<11.0	ug/kg	57.2	11.0	1	04/04/19 12:06	04/04/19 15:27	98-06-6	
Carbon tetrachloride	<27.4	ug/kg	229	27.4	1	04/04/19 12:06	04/04/19 15:27	56-23-5	
Chlorobenzene	<3.2	ug/kg	57.2	3.2	1	04/04/19 12:06	04/04/19 15:27	108-90-7	
Chloroethane	<29.8	ug/kg	572	29.8	1	04/04/19 12:06	04/04/19 15:27	75-00-3	
Chloroform	<28.6	ug/kg	57.2	28.6	1	04/04/19 12:06	04/04/19 15:27	67-66-3	
Chloromethane	<13.7	ug/kg	229	13.7	1	04/04/19 12:06	04/04/19 15:27	74-87-3	
2-Chlorotoluene	<2.8	ug/kg	57.2	2.8	1	04/04/19 12:06	04/04/19 15:27	95-49-8	
4-Chlorotoluene	<2.9	ug/kg	57.2	2.9	1	04/04/19 12:06	04/04/19 15:27	106-43-4	
1,2-Dibromo-3-chloropropane	<199	ug/kg	572	199	1	04/04/19 12:06	04/04/19 15:27	96-12-8	
Dibromochloromethane	<6.6	ug/kg	229	6.6	1	04/04/19 12:06	04/04/19 15:27	124-48-1	
1,2-Dibromoethane (EDB)	<6.0	ug/kg	57.2	6.0	1	04/04/19 12:06	04/04/19 15:27	106-93-4	
Dibromomethane	<10.5	ug/kg	57.2	10.5	1	04/04/19 12:06	04/04/19 15:27	74-95-3	
1,2-Dichlorobenzene	<2.3	ug/kg	57.2	2.3	1	04/04/19 12:06	04/04/19 15:27	95-50-1	
1,3-Dichlorobenzene	<2.1	ug/kg	57.2	2.1	1	04/04/19 12:06	04/04/19 15:27	541-73-1	
1,4-Dichlorobenzene	<3.5	ug/kg	57.2	3.5	1	04/04/19 12:06	04/04/19 15:27	106-46-7	
Dichlorodifluoromethane	<18.5	ug/kg	229	18.5	1	04/04/19 12:06	04/04/19 15:27	75-71-8	
1,1-Dichloroethane	<6.4	ug/kg	57.2	6.4	1	04/04/19 12:06	04/04/19 15:27	75-34-3	
1,2-Dichloroethane	<6.3	ug/kg	57.2	6.3	1	04/04/19 12:06	04/04/19 15:27	107-06-2	
1,1-Dichloroethene	<17.2	ug/kg	57.2	17.2	1	04/04/19 12:06	04/04/19 15:27	75-35-4	
cis-1,2-Dichloroethene	<9.5	ug/kg	57.2	9.5	1	04/04/19 12:06	04/04/19 15:27	156-59-2	
trans-1,2-Dichloroethene	<26.8	ug/kg	57.2	26.8	1	04/04/19 12:06	04/04/19 15:27	156-60-5	
Dichlorofluoromethane	<79.1	ug/kg	572	79.1	1	04/04/19 12:06	04/04/19 15:27	75-43-4	N2
1,2-Dichloropropane	<9.9	ug/kg	57.2	9.9	1	04/04/19 12:06	04/04/19 15:27	78-87-5	
1,3-Dichloropropane	<7.9	ug/kg	57.2	7.9	1	04/04/19 12:06	04/04/19 15:27	142-28-9	
2,2-Dichloropropane	<7.1	ug/kg	229	7.1	1	04/04/19 12:06	04/04/19 15:27	594-20-7	
1,1-Dichloropropene	<26.4	ug/kg	57.2	26.4	1	04/04/19 12:06	04/04/19 15:27	563-58-6	
cis-1,3-Dichloropropene	<8.2	ug/kg	57.2	8.2	1	04/04/19 12:06	04/04/19 15:27	10061-01-5	
trans-1,3-Dichloropropene	<8.0	ug/kg	57.2	8.0	1	04/04/19 12:06	04/04/19 15:27	10061-02-6	
Diethyl ether (Ethyl ether)	<35.0	ug/kg	229	35.0	1	04/04/19 12:06	04/04/19 15:27	60-29-7	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-01-(0-10ft) **Lab ID: 10469445001** Collected: 04/02/19 09:25 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Ethylbenzene	<3.1	ug/kg	57.2	3.1	1	04/04/19 12:06	04/04/19 15:27	100-41-4	
Hexachloro-1,3-butadiene	<14.0	ug/kg	286	14.0	1	04/04/19 12:06	04/04/19 15:27	87-68-3	
Isopropylbenzene (Cumene)	<2.5	ug/kg	57.2	2.5	1	04/04/19 12:06	04/04/19 15:27	98-82-8	
p-Isopropyltoluene	<17.4	ug/kg	57.2	17.4	1	04/04/19 12:06	04/04/19 15:27	99-87-6	
Methylene Chloride	<108	ug/kg	229	108	1	04/04/19 12:06	04/04/19 15:27	75-09-2	
4-Methyl-2-pentanone (MIBK)	<11.9	ug/kg	286	11.9	1	04/04/19 12:06	04/04/19 15:27	108-10-1	
Methyl-tert-butyl ether	<6.8	ug/kg	57.2	6.8	1	04/04/19 12:06	04/04/19 15:27	1634-04-4	
Naphthalene	<53.6	ug/kg	229	53.6	1	04/04/19 12:06	04/04/19 15:27	91-20-3	
n-Propylbenzene	<3.1	ug/kg	57.2	3.1	1	04/04/19 12:06	04/04/19 15:27	103-65-1	
Styrene	<2.6	ug/kg	57.2	2.6	1	04/04/19 12:06	04/04/19 15:27	100-42-5	
1,1,1,2-Tetrachloroethane	<18.0	ug/kg	57.2	18.0	1	04/04/19 12:06	04/04/19 15:27	630-20-6	
1,1,2,2-Tetrachloroethane	<10.1	ug/kg	57.2	10.1	1	04/04/19 12:06	04/04/19 15:27	79-34-5	
Tetrachloroethene	<20.1	ug/kg	57.2	20.1	1	04/04/19 12:06	04/04/19 15:27	127-18-4	
Tetrahydrofuran	<83.2	ug/kg	2290	83.2	1	04/04/19 12:06	04/04/19 15:27	109-99-9	
Toluene	<14.0	ug/kg	57.2	14.0	1	04/04/19 12:06	04/04/19 15:27	108-88-3	
1,2,3-Trichlorobenzene	<9.1	ug/kg	57.2	9.1	1	04/04/19 12:06	04/04/19 15:27	87-61-6	
1,2,4-Trichlorobenzene	<12.7	ug/kg	57.2	12.7	1	04/04/19 12:06	04/04/19 15:27	120-82-1	
1,1,1-Trichloroethane	<26.7	ug/kg	57.2	26.7	1	04/04/19 12:06	04/04/19 15:27	71-55-6	
1,1,2-Trichloroethane	<6.8	ug/kg	57.2	6.8	1	04/04/19 12:06	04/04/19 15:27	79-00-5	
Trichloroethene	<8.8	ug/kg	57.2	8.8	1	04/04/19 12:06	04/04/19 15:27	79-01-6	
Trichlorofluoromethane	<99.8	ug/kg	229	99.8	1	04/04/19 12:06	04/04/19 15:27	75-69-4	
1,2,3-Trichloropropane	<15.0	ug/kg	229	15.0	1	04/04/19 12:06	04/04/19 15:27	96-18-4	
1,1,2-Trichlorotrifluoroethane	<66.4	ug/kg	229	66.4	1	04/04/19 12:06	04/04/19 15:27	76-13-1	
1,2,4-Trimethylbenzene	<11.4	ug/kg	57.2	11.4	1	04/04/19 12:06	04/04/19 15:27	95-63-6	
1,3,5-Trimethylbenzene	<9.1	ug/kg	57.2	9.1	1	04/04/19 12:06	04/04/19 15:27	108-67-8	
Vinyl chloride	<11.3	ug/kg	22.9	11.3	1	04/04/19 12:06	04/04/19 15:27	75-01-4	
Xylene (Total)	<13.3	ug/kg	172	13.3	1	04/04/19 12:06	04/04/19 15:27	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	104	%	75-125		1	04/04/19 12:06	04/04/19 15:27	17060-07-0	
Toluene-d8 (S)	104	%	75-125		1	04/04/19 12:06	04/04/19 15:27	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1	04/04/19 12:06	04/04/19 15:27	460-00-4	

Sample: FL-SB-02 (0-6ft) **Lab ID: 10469445002** Collected: 04/02/19 10:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	3.0J	mg/kg	10.4	2.7	1	04/04/19 08:23	04/05/19 14:46		
Surrogates									
n-Triacontane (S)	91	%	50-150		1	04/04/19 08:23	04/05/19 14:46	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	<1.7	mg/kg	13.2	1.7	1	04/11/19 13:33	04/12/19 02:59		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-02 (0-6ft) **Lab ID: 10469445002** Collected: 04/02/19 10:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Surrogates									
a,a,a-Trifluorotoluene (S)	99	%	80-150		1	04/11/19 13:33	04/12/19 02:59	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	102	mg/kg	0.62	0.051	1	04/05/19 11:58	04/09/19 13:24	7440-39-3	
Silver	<0.045	mg/kg	0.62	0.045	1	04/05/19 11:58	04/09/19 13:24	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	7.0	mg/kg	0.61	0.22	20	04/05/19 11:58	04/15/19 23:11	7440-38-2	
Cadmium	0.24	mg/kg	0.098	0.033	20	04/05/19 11:58	04/15/19 23:11	7440-43-9	
Chromium	15.2	mg/kg	0.61	0.15	20	04/05/19 11:58	04/15/19 23:11	7440-47-3	
Lead	9.5	mg/kg	0.24	0.070	20	04/05/19 11:58	04/15/19 23:11	7439-92-1	
Selenium	1.2	mg/kg	0.61	0.18	20	04/05/19 11:58	04/15/19 23:11	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.028	mg/kg	0.024	0.0097	1	04/05/19 12:48	04/15/19 13:13	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	22.2	%	0.10	0.10	1		04/05/19 13:31		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<0.52	ug/kg	12.8	0.52	1	04/04/19 09:08	04/05/19 18:20	83-32-9	
Acenaphthylene	<0.63	ug/kg	12.8	0.63	1	04/04/19 09:08	04/05/19 18:20	208-96-8	
Anthracene	<0.60	ug/kg	12.8	0.60	1	04/04/19 09:08	04/05/19 18:20	120-12-7	
Benzo(a)anthracene	<1.4	ug/kg	12.8	1.4	1	04/04/19 09:08	04/05/19 18:20	56-55-3	
Benzo(a)pyrene	<0.88	ug/kg	12.8	0.88	1	04/04/19 09:08	04/05/19 18:20	50-32-8	
Benzo(b)fluoranthene	<0.48	ug/kg	12.8	0.48	1	04/04/19 09:08	04/05/19 18:20	205-99-2	
Benzo(e)pyrene	<0.92	ug/kg	12.8	0.92	1	04/04/19 09:08	04/05/19 18:20	192-97-2	N2
Benzo(g,h,i)perylene	<0.81	ug/kg	12.8	0.81	1	04/04/19 09:08	04/05/19 18:20	191-24-2	
Benzo(k)fluoranthene	<1.1	ug/kg	12.8	1.1	1	04/04/19 09:08	04/05/19 18:20	207-08-9	
Chrysene	<1.7	ug/kg	12.8	1.7	1	04/04/19 09:08	04/05/19 18:20	218-01-9	
Dibenz(a,h)anthracene	<0.59	ug/kg	12.8	0.59	1	04/04/19 09:08	04/05/19 18:20	53-70-3	
Fluoranthene	<0.55	ug/kg	12.8	0.55	1	04/04/19 09:08	04/05/19 18:20	206-44-0	
Fluorene	<0.40	ug/kg	12.8	0.40	1	04/04/19 09:08	04/05/19 18:20	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.86	ug/kg	12.8	0.86	1	04/04/19 09:08	04/05/19 18:20	193-39-5	
Naphthalene	<0.99	ug/kg	12.8	0.99	1	04/04/19 09:08	04/05/19 18:20	91-20-3	
Phenanthrene	<2.5	ug/kg	12.8	2.5	1	04/04/19 09:08	04/05/19 18:20	85-01-8	
Pyrene	<2.0	ug/kg	12.8	2.0	1	04/04/19 09:08	04/05/19 18:20	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	70	%	30-125		1	04/04/19 09:08	04/05/19 18:20	321-60-8	
p-Terphenyl-d14 (S)	74	%	30-125		1	04/04/19 09:08	04/05/19 18:20	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<409	ug/kg	1320	409	1	04/04/19 12:06	04/04/19 15:45	67-64-1	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-02 (0-6ft)** Lab ID: **10469445002** Collected: 04/02/19 10:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Allyl chloride	<55.1	ug/kg	263	55.1	1	04/04/19 12:06	04/04/19 15:45	107-05-1	
Benzene	<3.7	ug/kg	26.3	3.7	1	04/04/19 12:06	04/04/19 15:45	71-43-2	
Bromobenzene	<4.0	ug/kg	65.8	4.0	1	04/04/19 12:06	04/04/19 15:45	108-86-1	
Bromochloromethane	<22.8	ug/kg	65.8	22.8	1	04/04/19 12:06	04/04/19 15:45	74-97-5	
Bromodichloromethane	<22.5	ug/kg	65.8	22.5	1	04/04/19 12:06	04/04/19 15:45	75-27-4	
Bromoform	<99.6	ug/kg	263	99.6	1	04/04/19 12:06	04/04/19 15:45	75-25-2	
Bromomethane	<77.0	ug/kg	658	77.0	1	04/04/19 12:06	04/04/19 15:45	74-83-9	
2-Butanone (MEK)	<35.0	ug/kg	329	35.0	1	04/04/19 12:06	04/04/19 15:45	78-93-3	
n-Butylbenzene	<31.3	ug/kg	65.8	31.3	1	04/04/19 12:06	04/04/19 15:45	104-51-8	
sec-Butylbenzene	<12.6	ug/kg	65.8	12.6	1	04/04/19 12:06	04/04/19 15:45	135-98-8	
tert-Butylbenzene	<12.6	ug/kg	65.8	12.6	1	04/04/19 12:06	04/04/19 15:45	98-06-6	
Carbon tetrachloride	<31.5	ug/kg	263	31.5	1	04/04/19 12:06	04/04/19 15:45	56-23-5	
Chlorobenzene	<3.7	ug/kg	65.8	3.7	1	04/04/19 12:06	04/04/19 15:45	108-90-7	
Chloroethane	<34.2	ug/kg	658	34.2	1	04/04/19 12:06	04/04/19 15:45	75-00-3	
Chloroform	<32.9	ug/kg	65.8	32.9	1	04/04/19 12:06	04/04/19 15:45	67-66-3	
Chloromethane	<15.8	ug/kg	263	15.8	1	04/04/19 12:06	04/04/19 15:45	74-87-3	
2-Chlorotoluene	<3.2	ug/kg	65.8	3.2	1	04/04/19 12:06	04/04/19 15:45	95-49-8	
4-Chlorotoluene	<3.4	ug/kg	65.8	3.4	1	04/04/19 12:06	04/04/19 15:45	106-43-4	
1,2-Dibromo-3-chloropropane	<229	ug/kg	658	229	1	04/04/19 12:06	04/04/19 15:45	96-12-8	
Dibromochloromethane	<7.6	ug/kg	263	7.6	1	04/04/19 12:06	04/04/19 15:45	124-48-1	
1,2-Dibromoethane (EDB)	<6.9	ug/kg	65.8	6.9	1	04/04/19 12:06	04/04/19 15:45	106-93-4	
Dibromomethane	<12.1	ug/kg	65.8	12.1	1	04/04/19 12:06	04/04/19 15:45	74-95-3	
1,2-Dichlorobenzene	<2.7	ug/kg	65.8	2.7	1	04/04/19 12:06	04/04/19 15:45	95-50-1	
1,3-Dichlorobenzene	<2.4	ug/kg	65.8	2.4	1	04/04/19 12:06	04/04/19 15:45	541-73-1	
1,4-Dichlorobenzene	<4.1	ug/kg	65.8	4.1	1	04/04/19 12:06	04/04/19 15:45	106-46-7	
Dichlorodifluoromethane	<21.3	ug/kg	263	21.3	1	04/04/19 12:06	04/04/19 15:45	75-71-8	
1,1-Dichloroethane	<7.4	ug/kg	65.8	7.4	1	04/04/19 12:06	04/04/19 15:45	75-34-3	
1,2-Dichloroethane	<7.2	ug/kg	65.8	7.2	1	04/04/19 12:06	04/04/19 15:45	107-06-2	
1,1-Dichloroethene	<19.7	ug/kg	65.8	19.7	1	04/04/19 12:06	04/04/19 15:45	75-35-4	
cis-1,2-Dichloroethene	<10.9	ug/kg	65.8	10.9	1	04/04/19 12:06	04/04/19 15:45	156-59-2	
trans-1,2-Dichloroethene	<30.8	ug/kg	65.8	30.8	1	04/04/19 12:06	04/04/19 15:45	156-60-5	
Dichlorofluoromethane	<90.9	ug/kg	658	90.9	1	04/04/19 12:06	04/04/19 15:45	75-43-4	N2
1,2-Dichloropropane	<11.3	ug/kg	65.8	11.3	1	04/04/19 12:06	04/04/19 15:45	78-87-5	
1,3-Dichloropropane	<9.1	ug/kg	65.8	9.1	1	04/04/19 12:06	04/04/19 15:45	142-28-9	
2,2-Dichloropropane	<8.2	ug/kg	263	8.2	1	04/04/19 12:06	04/04/19 15:45	594-20-7	
1,1-Dichloropropene	<30.4	ug/kg	65.8	30.4	1	04/04/19 12:06	04/04/19 15:45	563-58-6	
cis-1,3-Dichloropropene	<9.4	ug/kg	65.8	9.4	1	04/04/19 12:06	04/04/19 15:45	10061-01-5	
trans-1,3-Dichloropropene	<9.1	ug/kg	65.8	9.1	1	04/04/19 12:06	04/04/19 15:45	10061-02-6	
Diethyl ether (Ethyl ether)	<40.3	ug/kg	263	40.3	1	04/04/19 12:06	04/04/19 15:45	60-29-7	
Ethylbenzene	<3.6	ug/kg	65.8	3.6	1	04/04/19 12:06	04/04/19 15:45	100-41-4	
Hexachloro-1,3-butadiene	<16.1	ug/kg	329	16.1	1	04/04/19 12:06	04/04/19 15:45	87-68-3	
Isopropylbenzene (Cumene)	<2.9	ug/kg	65.8	2.9	1	04/04/19 12:06	04/04/19 15:45	98-82-8	
p-Isopropyltoluene	<20.0	ug/kg	65.8	20.0	1	04/04/19 12:06	04/04/19 15:45	99-87-6	
Methylene Chloride	<124	ug/kg	263	124	1	04/04/19 12:06	04/04/19 15:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	<13.7	ug/kg	329	13.7	1	04/04/19 12:06	04/04/19 15:45	108-10-1	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-02 (0-6ft) **Lab ID: 10469445002** Collected: 04/02/19 10:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Methyl-tert-butyl ether	<7.8	ug/kg	65.8	7.8	1	04/04/19 12:06	04/04/19 15:45	1634-04-4	
Naphthalene	<61.6	ug/kg	263	61.6	1	04/04/19 12:06	04/04/19 15:45	91-20-3	
n-Propylbenzene	<3.5	ug/kg	65.8	3.5	1	04/04/19 12:06	04/04/19 15:45	103-65-1	
Styrene	<3.0	ug/kg	65.8	3.0	1	04/04/19 12:06	04/04/19 15:45	100-42-5	
1,1,1,2-Tetrachloroethane	<20.7	ug/kg	65.8	20.7	1	04/04/19 12:06	04/04/19 15:45	630-20-6	
1,1,2,2-Tetrachloroethane	<11.6	ug/kg	65.8	11.6	1	04/04/19 12:06	04/04/19 15:45	79-34-5	
Tetrachloroethene	<23.2	ug/kg	65.8	23.2	1	04/04/19 12:06	04/04/19 15:45	127-18-4	
Tetrahydrofuran	<95.7	ug/kg	2630	95.7	1	04/04/19 12:06	04/04/19 15:45	109-99-9	
Toluene	<16.1	ug/kg	65.8	16.1	1	04/04/19 12:06	04/04/19 15:45	108-88-3	
1,2,3-Trichlorobenzene	<10.5	ug/kg	65.8	10.5	1	04/04/19 12:06	04/04/19 15:45	87-61-6	
1,2,4-Trichlorobenzene	<14.6	ug/kg	65.8	14.6	1	04/04/19 12:06	04/04/19 15:45	120-82-1	
1,1,1-Trichloroethane	<30.7	ug/kg	65.8	30.7	1	04/04/19 12:06	04/04/19 15:45	71-55-6	
1,1,2-Trichloroethane	<7.9	ug/kg	65.8	7.9	1	04/04/19 12:06	04/04/19 15:45	79-00-5	
Trichloroethene	<10.1	ug/kg	65.8	10.1	1	04/04/19 12:06	04/04/19 15:45	79-01-6	
Trichlorofluoromethane	<115	ug/kg	263	115	1	04/04/19 12:06	04/04/19 15:45	75-69-4	
1,2,3-Trichloropropane	<17.2	ug/kg	263	17.2	1	04/04/19 12:06	04/04/19 15:45	96-18-4	
1,1,2-Trichlorotrifluoroethane	<76.3	ug/kg	263	76.3	1	04/04/19 12:06	04/04/19 15:45	76-13-1	
1,2,4-Trimethylbenzene	<13.2	ug/kg	65.8	13.2	1	04/04/19 12:06	04/04/19 15:45	95-63-6	
1,3,5-Trimethylbenzene	<10.5	ug/kg	65.8	10.5	1	04/04/19 12:06	04/04/19 15:45	108-67-8	
Vinyl chloride	<12.9	ug/kg	26.3	12.9	1	04/04/19 12:06	04/04/19 15:45	75-01-4	
Xylene (Total)	<15.3	ug/kg	197	15.3	1	04/04/19 12:06	04/04/19 15:45	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	105	%	75-125		1	04/04/19 12:06	04/04/19 15:45	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1	04/04/19 12:06	04/04/19 15:45	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1	04/04/19 12:06	04/04/19 15:45	460-00-4	

Sample: FL-SB-03 (0-6.5ft) **Lab ID: 10469445003** Collected: 04/02/19 10:25 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	183	mg/kg	53.3	13.9	5	04/04/19 08:23	04/05/19 16:12		T6
Surrogates									
n-Triacontane (S)	128	%	50-150		5	04/04/19 08:23	04/05/19 16:12	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	7.0J	mg/kg	12.3	1.6	1	04/11/19 13:33	04/12/19 03:25		G+
Surrogates									
a,a,a-Trifluorotoluene (S)	100	%	80-150		1	04/11/19 13:33	04/12/19 03:25	98-08-8	
6010D MET ICP		Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Barium	100	mg/kg	0.62	0.051	1	04/05/19 11:58	04/09/19 13:27	7440-39-3	
Silver	<0.045	mg/kg	0.62	0.045	1	04/05/19 11:58	04/09/19 13:27	7440-22-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-03 (0-6.5ft) **Lab ID: 10469445003** Collected: 04/02/19 10:25 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	4.9	mg/kg	0.60	0.21	20	04/05/19 11:58	04/15/19 23:16	7440-38-2	
Cadmium	0.24	mg/kg	0.097	0.032	20	04/05/19 11:58	04/15/19 23:16	7440-43-9	
Chromium	18.1	mg/kg	0.60	0.15	20	04/05/19 11:58	04/15/19 23:16	7440-47-3	
Lead	24.8	mg/kg	0.24	0.069	20	04/05/19 11:58	04/15/19 23:16	7439-92-1	
Selenium	1.4	mg/kg	0.60	0.18	20	04/05/19 11:58	04/15/19 23:16	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.22	mg/kg	0.024	0.0094	1	04/05/19 12:48	04/15/19 13:15	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	22.6	%	0.10	0.10	1		04/05/19 13:32		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	52.0	ug/kg	12.9	0.53	1	04/04/19 09:08	04/05/19 18:41	83-32-9	
Acenaphthylene	18.4	ug/kg	12.9	0.64	1	04/04/19 09:08	04/05/19 18:41	208-96-8	
Anthracene	174	ug/kg	12.9	0.60	1	04/04/19 09:08	04/05/19 18:41	120-12-7	
Benzo(a)anthracene	271	ug/kg	12.9	1.4	1	04/04/19 09:08	04/05/19 18:41	56-55-3	
Benzo(a)pyrene	257	ug/kg	12.9	0.89	1	04/04/19 09:08	04/05/19 18:41	50-32-8	
Benzo(b)fluoranthene	267	ug/kg	12.9	0.48	1	04/04/19 09:08	04/05/19 18:41	205-99-2	
Benzo(e)pyrene	159	ug/kg	12.9	0.93	1	04/04/19 09:08	04/05/19 18:41	192-97-2	N2
Benzo(g,h,i)perylene	174	ug/kg	12.9	0.82	1	04/04/19 09:08	04/05/19 18:41	191-24-2	
Benzo(k)fluoranthene	158	ug/kg	12.9	1.1	1	04/04/19 09:08	04/05/19 18:41	207-08-9	
Chrysene	237	ug/kg	12.9	1.8	1	04/04/19 09:08	04/05/19 18:41	218-01-9	
Dibenz(a,h)anthracene	49.0	ug/kg	12.9	0.59	1	04/04/19 09:08	04/05/19 18:41	53-70-3	
Fluoranthene	668	ug/kg	64.5	2.8	5	04/04/19 09:08	04/08/19 12:42	206-44-0	
Fluorene	83.1	ug/kg	12.9	0.40	1	04/04/19 09:08	04/05/19 18:41	86-73-7	
Indeno(1,2,3-cd)pyrene	152	ug/kg	12.9	0.86	1	04/04/19 09:08	04/05/19 18:41	193-39-5	
Naphthalene	49.2	ug/kg	12.9	0.99	1	04/04/19 09:08	04/05/19 18:41	91-20-3	
Phenanthrene	503	ug/kg	64.5	12.4	5	04/04/19 09:08	04/08/19 12:42	85-01-8	
Pyrene	508	ug/kg	64.5	9.9	5	04/04/19 09:08	04/08/19 12:42	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	72	%	30-125		1	04/04/19 09:08	04/05/19 18:41	321-60-8	
p-Terphenyl-d14 (S)	73	%	30-125		1	04/04/19 09:08	04/05/19 18:41	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<417	ug/kg	1340	417	1	04/04/19 12:06	04/04/19 16:03	67-64-1	
Allyl chloride	<56.2	ug/kg	268	56.2	1	04/04/19 12:06	04/04/19 16:03	107-05-1	
Benzene	4.8J	ug/kg	26.8	3.8	1	04/04/19 12:06	04/04/19 16:03	71-43-2	
Bromobenzene	<4.1	ug/kg	67.1	4.1	1	04/04/19 12:06	04/04/19 16:03	108-86-1	
Bromochloromethane	<23.2	ug/kg	67.1	23.2	1	04/04/19 12:06	04/04/19 16:03	74-97-5	
Bromodichloromethane	<22.9	ug/kg	67.1	22.9	1	04/04/19 12:06	04/04/19 16:03	75-27-4	
Bromoform	<102	ug/kg	268	102	1	04/04/19 12:06	04/04/19 16:03	75-25-2	
Bromomethane	<78.5	ug/kg	671	78.5	1	04/04/19 12:06	04/04/19 16:03	74-83-9	
2-Butanone (MEK)	<35.7	ug/kg	335	35.7	1	04/04/19 12:06	04/04/19 16:03	78-93-3	
n-Butylbenzene	<31.9	ug/kg	67.1	31.9	1	04/04/19 12:06	04/04/19 16:03	104-51-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-03 (0-6.5ft)** Lab ID: **10469445003** Collected: 04/02/19 10:25 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
sec-Butylbenzene	<12.8	ug/kg	67.1	12.8	1	04/04/19 12:06	04/04/19 16:03	135-98-8	
tert-Butylbenzene	<12.9	ug/kg	67.1	12.9	1	04/04/19 12:06	04/04/19 16:03	98-06-6	
Carbon tetrachloride	<32.1	ug/kg	268	32.1	1	04/04/19 12:06	04/04/19 16:03	56-23-5	
Chlorobenzene	<3.8	ug/kg	67.1	3.8	1	04/04/19 12:06	04/04/19 16:03	108-90-7	
Chloroethane	<34.9	ug/kg	671	34.9	1	04/04/19 12:06	04/04/19 16:03	75-00-3	
Chloroform	<33.5	ug/kg	67.1	33.5	1	04/04/19 12:06	04/04/19 16:03	67-66-3	
Chloromethane	<16.1	ug/kg	268	16.1	1	04/04/19 12:06	04/04/19 16:03	74-87-3	
2-Chlorotoluene	<3.3	ug/kg	67.1	3.3	1	04/04/19 12:06	04/04/19 16:03	95-49-8	
4-Chlorotoluene	<3.4	ug/kg	67.1	3.4	1	04/04/19 12:06	04/04/19 16:03	106-43-4	
1,2-Dibromo-3-chloropropane	<233	ug/kg	671	233	1	04/04/19 12:06	04/04/19 16:03	96-12-8	
Dibromochloromethane	<7.8	ug/kg	268	7.8	1	04/04/19 12:06	04/04/19 16:03	124-48-1	
1,2-Dibromoethane (EDB)	<7.1	ug/kg	67.1	7.1	1	04/04/19 12:06	04/04/19 16:03	106-93-4	
Dibromomethane	<12.3	ug/kg	67.1	12.3	1	04/04/19 12:06	04/04/19 16:03	74-95-3	
1,2-Dichlorobenzene	<2.7	ug/kg	67.1	2.7	1	04/04/19 12:06	04/04/19 16:03	95-50-1	
1,3-Dichlorobenzene	<2.4	ug/kg	67.1	2.4	1	04/04/19 12:06	04/04/19 16:03	541-73-1	
1,4-Dichlorobenzene	<4.2	ug/kg	67.1	4.2	1	04/04/19 12:06	04/04/19 16:03	106-46-7	
Dichlorodifluoromethane	<21.7	ug/kg	268	21.7	1	04/04/19 12:06	04/04/19 16:03	75-71-8	
1,1-Dichloroethane	<7.5	ug/kg	67.1	7.5	1	04/04/19 12:06	04/04/19 16:03	75-34-3	
1,2-Dichloroethane	<7.4	ug/kg	67.1	7.4	1	04/04/19 12:06	04/04/19 16:03	107-06-2	
1,1-Dichloroethene	<20.1	ug/kg	67.1	20.1	1	04/04/19 12:06	04/04/19 16:03	75-35-4	
cis-1,2-Dichloroethene	<11.1	ug/kg	67.1	11.1	1	04/04/19 12:06	04/04/19 16:03	156-59-2	
trans-1,2-Dichloroethene	<31.4	ug/kg	67.1	31.4	1	04/04/19 12:06	04/04/19 16:03	156-60-5	
Dichlorofluoromethane	<92.7	ug/kg	671	92.7	1	04/04/19 12:06	04/04/19 16:03	75-43-4	N2
1,2-Dichloropropane	<11.6	ug/kg	67.1	11.6	1	04/04/19 12:06	04/04/19 16:03	78-87-5	
1,3-Dichloropropane	<9.3	ug/kg	67.1	9.3	1	04/04/19 12:06	04/04/19 16:03	142-28-9	
2,2-Dichloropropane	<8.4	ug/kg	268	8.4	1	04/04/19 12:06	04/04/19 16:03	594-20-7	
1,1-Dichloropropene	<31.0	ug/kg	67.1	31.0	1	04/04/19 12:06	04/04/19 16:03	563-58-6	
cis-1,3-Dichloropropene	<9.6	ug/kg	67.1	9.6	1	04/04/19 12:06	04/04/19 16:03	10061-01-5	
trans-1,3-Dichloropropene	<9.3	ug/kg	67.1	9.3	1	04/04/19 12:06	04/04/19 16:03	10061-02-6	
Diethyl ether (Ethyl ether)	<41.0	ug/kg	268	41.0	1	04/04/19 12:06	04/04/19 16:03	60-29-7	
Ethylbenzene	<3.6	ug/kg	67.1	3.6	1	04/04/19 12:06	04/04/19 16:03	100-41-4	
Hexachloro-1,3-butadiene	<16.4	ug/kg	335	16.4	1	04/04/19 12:06	04/04/19 16:03	87-68-3	
Isopropylbenzene (Cumene)	<3.0	ug/kg	67.1	3.0	1	04/04/19 12:06	04/04/19 16:03	98-82-8	
p-Isopropyltoluene	<20.4	ug/kg	67.1	20.4	1	04/04/19 12:06	04/04/19 16:03	99-87-6	
Methylene Chloride	<126	ug/kg	268	126	1	04/04/19 12:06	04/04/19 16:03	75-09-2	
4-Methyl-2-pentanone (MIBK)	<13.9	ug/kg	335	13.9	1	04/04/19 12:06	04/04/19 16:03	108-10-1	
Methyl-tert-butyl ether	<8.0	ug/kg	67.1	8.0	1	04/04/19 12:06	04/04/19 16:03	1634-04-4	
Naphthalene	<62.8	ug/kg	268	62.8	1	04/04/19 12:06	04/04/19 16:03	91-20-3	
n-Propylbenzene	<3.6	ug/kg	67.1	3.6	1	04/04/19 12:06	04/04/19 16:03	103-65-1	
Styrene	<3.1	ug/kg	67.1	3.1	1	04/04/19 12:06	04/04/19 16:03	100-42-5	
1,1,1,2-Tetrachloroethane	<21.1	ug/kg	67.1	21.1	1	04/04/19 12:06	04/04/19 16:03	630-20-6	
1,1,2,2-Tetrachloroethane	<11.8	ug/kg	67.1	11.8	1	04/04/19 12:06	04/04/19 16:03	79-34-5	
Tetrachloroethene	<23.6	ug/kg	67.1	23.6	1	04/04/19 12:06	04/04/19 16:03	127-18-4	
Tetrahydrofuran	<97.5	ug/kg	2680	97.5	1	04/04/19 12:06	04/04/19 16:03	109-99-9	
Toluene	<16.4	ug/kg	67.1	16.4	1	04/04/19 12:06	04/04/19 16:03	108-88-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-03 (0-6.5ft) **Lab ID: 10469445003** Collected: 04/02/19 10:25 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,2,3-Trichlorobenzene	<10.7	ug/kg	67.1	10.7	1	04/04/19 12:06	04/04/19 16:03	87-61-6	
1,2,4-Trichlorobenzene	<14.9	ug/kg	67.1	14.9	1	04/04/19 12:06	04/04/19 16:03	120-82-1	
1,1,1-Trichloroethane	<31.3	ug/kg	67.1	31.3	1	04/04/19 12:06	04/04/19 16:03	71-55-6	
1,1,2-Trichloroethane	<8.0	ug/kg	67.1	8.0	1	04/04/19 12:06	04/04/19 16:03	79-00-5	
Trichloroethene	<10.3	ug/kg	67.1	10.3	1	04/04/19 12:06	04/04/19 16:03	79-01-6	
Trichlorofluoromethane	<117	ug/kg	268	117	1	04/04/19 12:06	04/04/19 16:03	75-69-4	
1,2,3-Trichloropropane	<17.6	ug/kg	268	17.6	1	04/04/19 12:06	04/04/19 16:03	96-18-4	
1,1,2-Trichlorotrifluoroethane	<77.8	ug/kg	268	77.8	1	04/04/19 12:06	04/04/19 16:03	76-13-1	
1,2,4-Trimethylbenzene	<13.4	ug/kg	67.1	13.4	1	04/04/19 12:06	04/04/19 16:03	95-63-6	
1,3,5-Trimethylbenzene	<10.7	ug/kg	67.1	10.7	1	04/04/19 12:06	04/04/19 16:03	108-67-8	
Vinyl chloride	<13.2	ug/kg	26.8	13.2	1	04/04/19 12:06	04/04/19 16:03	75-01-4	
Xylene (Total)	<15.6	ug/kg	201	15.6	1	04/04/19 12:06	04/04/19 16:03	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	109	%	75-125		1	04/04/19 12:06	04/04/19 16:03	17060-07-0	
Toluene-d8 (S)	104	%	75-125		1	04/04/19 12:06	04/04/19 16:03	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1	04/04/19 12:06	04/04/19 16:03	460-00-4	

Sample: FL-SB-04 (0-2ft) **Lab ID: 10469445004** Collected: 04/02/19 10:45 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	94.9	mg/kg	45.5	11.8	5	04/04/19 08:23	04/05/19 16:19		T6
Surrogates									
n-Triacontane (S)	102	%	50-150		5	04/04/19 08:23	04/05/19 16:19	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.7	mg/kg	13.1	1.7	1	04/11/19 13:33	04/12/19 03:51		
Surrogates									
a,a,a-Trifluorotoluene (S)	101	%	80-150		1	04/11/19 13:33	04/12/19 03:51	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	66.0	mg/kg	0.60	0.050	1	04/05/19 11:58	04/09/19 13:30	7440-39-3	
Silver	0.046J	mg/kg	0.60	0.044	1	04/05/19 11:58	04/09/19 13:30	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	3.7	mg/kg	0.60	0.21	20	04/05/19 11:58	04/15/19 23:20	7440-38-2	
Cadmium	0.23	mg/kg	0.096	0.032	20	04/05/19 11:58	04/15/19 23:20	7440-43-9	
Chromium	12.8	mg/kg	0.60	0.15	20	04/05/19 11:58	04/15/19 23:20	7440-47-3	
Lead	20.9	mg/kg	0.24	0.069	20	04/05/19 11:58	04/15/19 23:20	7439-92-1	
Selenium	1.2	mg/kg	0.60	0.17	20	04/05/19 11:58	04/15/19 23:20	7782-49-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-04 (0-2ft) **Lab ID: 10469445004** Collected: 04/02/19 10:45 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.030	mg/kg	0.025	0.010	1	04/05/19 12:48	04/15/19 13:17	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	22.7	%	0.10	0.10	1		04/05/19 13:32		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	153	ug/kg	64.7	2.6	5	04/04/19 09:08	04/05/19 19:02	83-32-9	
Acenaphthylene	<3.2	ug/kg	64.7	3.2	5	04/04/19 09:08	04/05/19 19:02	208-96-8	
Anthracene	442	ug/kg	64.7	3.0	5	04/04/19 09:08	04/05/19 19:02	120-12-7	
Benzo(a)anthracene	756	ug/kg	64.7	7.0	5	04/04/19 09:08	04/05/19 19:02	56-55-3	
Benzo(a)pyrene	692	ug/kg	64.7	4.4	5	04/04/19 09:08	04/05/19 19:02	50-32-8	
Benzo(b)fluoranthene	873	ug/kg	64.7	2.4	5	04/04/19 09:08	04/05/19 19:02	205-99-2	
Benzo(e)pyrene	438	ug/kg	64.7	4.6	5	04/04/19 09:08	04/05/19 19:02	192-97-2	N2
Benzo(g,h,i)perylene	464	ug/kg	64.7	4.1	5	04/04/19 09:08	04/05/19 19:02	191-24-2	
Benzo(k)fluoranthene	368	ug/kg	64.7	5.5	5	04/04/19 09:08	04/05/19 19:02	207-08-9	
Chrysene	754	ug/kg	64.7	8.8	5	04/04/19 09:08	04/05/19 19:02	218-01-9	
Dibenz(a,h)anthracene	134	ug/kg	64.7	3.0	5	04/04/19 09:08	04/05/19 19:02	53-70-3	
Fluoranthene	2220	ug/kg	129	5.5	10	04/04/19 09:08	04/08/19 13:03	206-44-0	
Fluorene	163	ug/kg	64.7	2.0	5	04/04/19 09:08	04/05/19 19:02	86-73-7	
Indeno(1,2,3-cd)pyrene	404	ug/kg	64.7	4.3	5	04/04/19 09:08	04/05/19 19:02	193-39-5	
Naphthalene	25.4J	ug/kg	64.7	5.0	5	04/04/19 09:08	04/05/19 19:02	91-20-3	
Phenanthrene	1610	ug/kg	64.7	12.4	5	04/04/19 09:08	04/05/19 19:02	85-01-8	
Pyrene	1410	ug/kg	64.7	9.9	5	04/04/19 09:08	04/05/19 19:02	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	85	%	30-125		5	04/04/19 09:08	04/05/19 19:02	321-60-8	
p-Terphenyl-d14 (S)	79	%	30-125		5	04/04/19 09:08	04/05/19 19:02	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<408	ug/kg	1310	408	1	04/04/19 12:06	04/04/19 15:09	67-64-1	
Allyl chloride	<55.0	ug/kg	263	55.0	1	04/04/19 12:06	04/04/19 15:09	107-05-1	
Benzene	3.8J	ug/kg	26.3	3.7	1	04/04/19 12:06	04/04/19 15:09	71-43-2	
Bromobenzene	<4.0	ug/kg	65.7	4.0	1	04/04/19 12:06	04/04/19 15:09	108-86-1	
Bromochloromethane	<22.7	ug/kg	65.7	22.7	1	04/04/19 12:06	04/04/19 15:09	74-97-5	
Bromodichloromethane	<22.5	ug/kg	65.7	22.5	1	04/04/19 12:06	04/04/19 15:09	75-27-4	
Bromoform	<99.4	ug/kg	263	99.4	1	04/04/19 12:06	04/04/19 15:09	75-25-2	
Bromomethane	<76.8	ug/kg	657	76.8	1	04/04/19 12:06	04/04/19 15:09	74-83-9	
2-Butanone (MEK)	<34.9	ug/kg	328	34.9	1	04/04/19 12:06	04/04/19 15:09	78-93-3	
n-Butylbenzene	<31.3	ug/kg	65.7	31.3	1	04/04/19 12:06	04/04/19 15:09	104-51-8	
sec-Butylbenzene	<12.6	ug/kg	65.7	12.6	1	04/04/19 12:06	04/04/19 15:09	135-98-8	
tert-Butylbenzene	<12.6	ug/kg	65.7	12.6	1	04/04/19 12:06	04/04/19 15:09	98-06-6	
Carbon tetrachloride	<31.4	ug/kg	263	31.4	1	04/04/19 12:06	04/04/19 15:09	56-23-5	
Chlorobenzene	<3.7	ug/kg	65.7	3.7	1	04/04/19 12:06	04/04/19 15:09	108-90-7	
Chloroethane	<34.1	ug/kg	657	34.1	1	04/04/19 12:06	04/04/19 15:09	75-00-3	
Chloroform	<32.8	ug/kg	65.7	32.8	1	04/04/19 12:06	04/04/19 15:09	67-66-3	
Chloromethane	<15.8	ug/kg	263	15.8	1	04/04/19 12:06	04/04/19 15:09	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-04 (0-2ft)** Lab ID: **10469445004** Collected: 04/02/19 10:45 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
2-Chlorotoluene	<3.2	ug/kg	65.7	3.2	1	04/04/19 12:06	04/04/19 15:09	95-49-8	
4-Chlorotoluene	<3.4	ug/kg	65.7	3.4	1	04/04/19 12:06	04/04/19 15:09	106-43-4	
1,2-Dibromo-3-chloropropane	<228	ug/kg	657	228	1	04/04/19 12:06	04/04/19 15:09	96-12-8	
Dibromochloromethane	<7.6	ug/kg	263	7.6	1	04/04/19 12:06	04/04/19 15:09	124-48-1	
1,2-Dibromoethane (EDB)	<6.9	ug/kg	65.7	6.9	1	04/04/19 12:06	04/04/19 15:09	106-93-4	
Dibromomethane	<12.0	ug/kg	65.7	12.0	1	04/04/19 12:06	04/04/19 15:09	74-95-3	
1,2-Dichlorobenzene	<2.7	ug/kg	65.7	2.7	1	04/04/19 12:06	04/04/19 15:09	95-50-1	
1,3-Dichlorobenzene	<2.4	ug/kg	65.7	2.4	1	04/04/19 12:06	04/04/19 15:09	541-73-1	
1,4-Dichlorobenzene	<4.1	ug/kg	65.7	4.1	1	04/04/19 12:06	04/04/19 15:09	106-46-7	
Dichlorodifluoromethane	<21.3	ug/kg	263	21.3	1	04/04/19 12:06	04/04/19 15:09	75-71-8	
1,1-Dichloroethane	<7.4	ug/kg	65.7	7.4	1	04/04/19 12:06	04/04/19 15:09	75-34-3	
1,2-Dichloroethane	<7.2	ug/kg	65.7	7.2	1	04/04/19 12:06	04/04/19 15:09	107-06-2	
1,1-Dichloroethene	<19.7	ug/kg	65.7	19.7	1	04/04/19 12:06	04/04/19 15:09	75-35-4	
cis-1,2-Dichloroethene	<10.9	ug/kg	65.7	10.9	1	04/04/19 12:06	04/04/19 15:09	156-59-2	
trans-1,2-Dichloroethene	<30.7	ug/kg	65.7	30.7	1	04/04/19 12:06	04/04/19 15:09	156-60-5	
Dichlorofluoromethane	<90.7	ug/kg	657	90.7	1	04/04/19 12:06	04/04/19 15:09	75-43-4	N2
1,2-Dichloropropane	<11.3	ug/kg	65.7	11.3	1	04/04/19 12:06	04/04/19 15:09	78-87-5	
1,3-Dichloropropane	<9.1	ug/kg	65.7	9.1	1	04/04/19 12:06	04/04/19 15:09	142-28-9	
2,2-Dichloropropane	<8.2	ug/kg	263	8.2	1	04/04/19 12:06	04/04/19 15:09	594-20-7	
1,1-Dichloropropene	<30.3	ug/kg	65.7	30.3	1	04/04/19 12:06	04/04/19 15:09	563-58-6	
cis-1,3-Dichloropropene	<9.4	ug/kg	65.7	9.4	1	04/04/19 12:06	04/04/19 15:09	10061-01-5	
trans-1,3-Dichloropropene	<9.1	ug/kg	65.7	9.1	1	04/04/19 12:06	04/04/19 15:09	10061-02-6	
Diethyl ether (Ethyl ether)	<40.2	ug/kg	263	40.2	1	04/04/19 12:06	04/04/19 15:09	60-29-7	
Ethylbenzene	<3.6	ug/kg	65.7	3.6	1	04/04/19 12:06	04/04/19 15:09	100-41-4	
Hexachloro-1,3-butadiene	<16.0	ug/kg	328	16.0	1	04/04/19 12:06	04/04/19 15:09	87-68-3	
Isopropylbenzene (Cumene)	<2.9	ug/kg	65.7	2.9	1	04/04/19 12:06	04/04/19 15:09	98-82-8	
p-Isopropyltoluene	<20.0	ug/kg	65.7	20.0	1	04/04/19 12:06	04/04/19 15:09	99-87-6	
Methylene Chloride	<124	ug/kg	263	124	1	04/04/19 12:06	04/04/19 15:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	<13.7	ug/kg	328	13.7	1	04/04/19 12:06	04/04/19 15:09	108-10-1	
Methyl-tert-butyl ether	<7.8	ug/kg	65.7	7.8	1	04/04/19 12:06	04/04/19 15:09	1634-04-4	
Naphthalene	<61.5	ug/kg	263	61.5	1	04/04/19 12:06	04/04/19 15:09	91-20-3	
n-Propylbenzene	<3.5	ug/kg	65.7	3.5	1	04/04/19 12:06	04/04/19 15:09	103-65-1	
Styrene	<3.0	ug/kg	65.7	3.0	1	04/04/19 12:06	04/04/19 15:09	100-42-5	
1,1,1,2-Tetrachloroethane	<20.6	ug/kg	65.7	20.6	1	04/04/19 12:06	04/04/19 15:09	630-20-6	
1,1,1,2,2-Tetrachloroethane	<11.6	ug/kg	65.7	11.6	1	04/04/19 12:06	04/04/19 15:09	79-34-5	
Tetrachloroethene	<23.1	ug/kg	65.7	23.1	1	04/04/19 12:06	04/04/19 15:09	127-18-4	
Tetrahydrofuran	<95.5	ug/kg	2630	95.5	1	04/04/19 12:06	04/04/19 15:09	109-99-9	
Toluene	<16.0	ug/kg	65.7	16.0	1	04/04/19 12:06	04/04/19 15:09	108-88-3	
1,2,3-Trichlorobenzene	<10.5	ug/kg	65.7	10.5	1	04/04/19 12:06	04/04/19 15:09	87-61-6	
1,2,4-Trichlorobenzene	<14.6	ug/kg	65.7	14.6	1	04/04/19 12:06	04/04/19 15:09	120-82-1	
1,1,1-Trichloroethane	<30.6	ug/kg	65.7	30.6	1	04/04/19 12:06	04/04/19 15:09	71-55-6	
1,1,2-Trichloroethane	<7.9	ug/kg	65.7	7.9	1	04/04/19 12:06	04/04/19 15:09	79-00-5	
Trichloroethene	<10.1	ug/kg	65.7	10.1	1	04/04/19 12:06	04/04/19 15:09	79-01-6	
Trichlorofluoromethane	<115	ug/kg	263	115	1	04/04/19 12:06	04/04/19 15:09	75-69-4	
1,2,3-Trichloropropane	<17.2	ug/kg	263	17.2	1	04/04/19 12:06	04/04/19 15:09	96-18-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

Sample: FL-SB-04 (0-2ft) **Lab ID: 10469445004** Collected: 04/02/19 10:45 Received: 04/03/19 16:04 Matrix: Solid
Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,2-Trichlorotrifluoroethane	<76.2	ug/kg	263	76.2	1	04/04/19 12:06	04/04/19 15:09	76-13-1	
1,2,4-Trimethylbenzene	<13.1	ug/kg	65.7	13.1	1	04/04/19 12:06	04/04/19 15:09	95-63-6	
1,3,5-Trimethylbenzene	<10.5	ug/kg	65.7	10.5	1	04/04/19 12:06	04/04/19 15:09	108-67-8	
Vinyl chloride	<12.9	ug/kg	26.3	12.9	1	04/04/19 12:06	04/04/19 15:09	75-01-4	
Xylene (Total)	<15.2	ug/kg	197	15.2	1	04/04/19 12:06	04/04/19 15:09	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	105	%	75-125		1	04/04/19 12:06	04/04/19 15:09	17060-07-0	
Toluene-d8 (S)	105	%	75-125		1	04/04/19 12:06	04/04/19 15:09	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/04/19 12:06	04/04/19 15:09	460-00-4	

Sample: FL-SB-05 (0-6.5ft) **Lab ID: 10469445005** Collected: 04/02/19 11:15 Received: 04/03/19 16:04 Matrix: Solid
Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	8.0J	mg/kg	8.3	2.2	1	04/04/19 08:23	04/05/19 14:20		
Surrogates									
n-Triacontane (S)	89	%	50-150		1	04/04/19 08:23	04/05/19 14:20	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.5	mg/kg	11.8	1.5	1	04/11/19 13:33	04/12/19 04:18		
Surrogates									
a,a,a-Trifluorotoluene (S)	98	%	80-150		1	04/11/19 13:33	04/12/19 04:18	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	57.2	mg/kg	0.60	0.050	1	04/05/19 11:58	04/09/19 13:33	7440-39-3	
Silver	<0.044	mg/kg	0.60	0.044	1	04/05/19 11:58	04/09/19 13:33	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	3.1	mg/kg	0.57	0.20	20	04/05/19 11:58	04/15/19 23:25	7440-38-2	
Cadmium	0.084J	mg/kg	0.091	0.030	20	04/05/19 11:58	04/15/19 23:25	7440-43-9	
Chromium	12.5	mg/kg	0.57	0.14	20	04/05/19 11:58	04/15/19 23:25	7440-47-3	
Lead	8.1	mg/kg	0.23	0.065	20	04/05/19 11:58	04/15/19 23:25	7439-92-1	
Selenium	0.53J	mg/kg	0.57	0.17	20	04/05/19 11:58	04/15/19 23:25	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.027	mg/kg	0.022	0.0089	1	04/05/19 12:48	04/15/19 13:19	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	18.0	%	0.10	0.10	1		04/05/19 13:32		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

Sample: **FL-SB-05 (0-6.5ft)** Lab ID: **10469445005** Collected: 04/02/19 11:15 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<0.50	ug/kg	12.2	0.50	1	04/04/19 09:08	04/05/19 19:23	83-32-9	
Acenaphthylene	<0.60	ug/kg	12.2	0.60	1	04/04/19 09:08	04/05/19 19:23	208-96-8	
Anthracene	<0.57	ug/kg	12.2	0.57	1	04/04/19 09:08	04/05/19 19:23	120-12-7	
Benzo(a)anthracene	12.0J	ug/kg	12.2	1.3	1	04/04/19 09:08	04/05/19 19:23	56-55-3	
Benzo(a)pyrene	14.7	ug/kg	12.2	0.84	1	04/04/19 09:08	04/05/19 19:23	50-32-8	
Benzo(b)fluoranthene	17.5	ug/kg	12.2	0.45	1	04/04/19 09:08	04/05/19 19:23	205-99-2	
Benzo(e)pyrene	<0.88	ug/kg	12.2	0.88	1	04/04/19 09:08	04/05/19 19:23	192-97-2	N2
Benzo(g,h,i)perylene	<0.77	ug/kg	12.2	0.77	1	04/04/19 09:08	04/05/19 19:23	191-24-2	
Benzo(k)fluoranthene	<1.0	ug/kg	12.2	1.0	1	04/04/19 09:08	04/05/19 19:23	207-08-9	
Chrysene	14.8	ug/kg	12.2	1.7	1	04/04/19 09:08	04/05/19 19:23	218-01-9	
Dibenz(a,h)anthracene	<0.56	ug/kg	12.2	0.56	1	04/04/19 09:08	04/05/19 19:23	53-70-3	
Fluoranthene	25.8	ug/kg	12.2	0.52	1	04/04/19 09:08	04/05/19 19:23	206-44-0	
Fluorene	<0.38	ug/kg	12.2	0.38	1	04/04/19 09:08	04/05/19 19:23	86-73-7	
Indeno(1,2,3-cd)pyrene	<0.82	ug/kg	12.2	0.82	1	04/04/19 09:08	04/05/19 19:23	193-39-5	
Naphthalene	<0.94	ug/kg	12.2	0.94	1	04/04/19 09:08	04/05/19 19:23	91-20-3	
Phenanthrene	<2.3	ug/kg	12.2	2.3	1	04/04/19 09:08	04/05/19 19:23	85-01-8	
Pyrene	21.9	ug/kg	12.2	1.9	1	04/04/19 09:08	04/05/19 19:23	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	78	%	30-125		1	04/04/19 09:08	04/05/19 19:23	321-60-8	
p-Terphenyl-d14 (S)	74	%	30-125		1	04/04/19 09:08	04/05/19 19:23	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<365	ug/kg	1180	365	1	04/04/19 12:06	04/04/19 16:21	67-64-1	
Allyl chloride	<49.2	ug/kg	235	49.2	1	04/04/19 12:06	04/04/19 16:21	107-05-1	
Benzene	<3.3	ug/kg	23.5	3.3	1	04/04/19 12:06	04/04/19 16:21	71-43-2	
Bromobenzene	<3.6	ug/kg	58.8	3.6	1	04/04/19 12:06	04/04/19 16:21	108-86-1	
Bromochloromethane	<20.3	ug/kg	58.8	20.3	1	04/04/19 12:06	04/04/19 16:21	74-97-5	
Bromodichloromethane	<20.1	ug/kg	58.8	20.1	1	04/04/19 12:06	04/04/19 16:21	75-27-4	
Bromoform	<89.0	ug/kg	235	89.0	1	04/04/19 12:06	04/04/19 16:21	75-25-2	
Bromomethane	<68.7	ug/kg	588	68.7	1	04/04/19 12:06	04/04/19 16:21	74-83-9	
2-Butanone (MEK)	<31.3	ug/kg	294	31.3	1	04/04/19 12:06	04/04/19 16:21	78-93-3	
n-Butylbenzene	<28.0	ug/kg	58.8	28.0	1	04/04/19 12:06	04/04/19 16:21	104-51-8	
sec-Butylbenzene	<11.3	ug/kg	58.8	11.3	1	04/04/19 12:06	04/04/19 16:21	135-98-8	
tert-Butylbenzene	<11.3	ug/kg	58.8	11.3	1	04/04/19 12:06	04/04/19 16:21	98-06-6	
Carbon tetrachloride	<28.1	ug/kg	235	28.1	1	04/04/19 12:06	04/04/19 16:21	56-23-5	
Chlorobenzene	<3.3	ug/kg	58.8	3.3	1	04/04/19 12:06	04/04/19 16:21	108-90-7	
Chloroethane	<30.6	ug/kg	588	30.6	1	04/04/19 12:06	04/04/19 16:21	75-00-3	
Chloroform	<29.4	ug/kg	58.8	29.4	1	04/04/19 12:06	04/04/19 16:21	67-66-3	
Chloromethane	<14.1	ug/kg	235	14.1	1	04/04/19 12:06	04/04/19 16:21	74-87-3	
2-Chlorotoluene	<2.9	ug/kg	58.8	2.9	1	04/04/19 12:06	04/04/19 16:21	95-49-8	
4-Chlorotoluene	<3.0	ug/kg	58.8	3.0	1	04/04/19 12:06	04/04/19 16:21	106-43-4	
1,2-Dibromo-3-chloropropane	<204	ug/kg	588	204	1	04/04/19 12:06	04/04/19 16:21	96-12-8	
Dibromochloromethane	<6.8	ug/kg	235	6.8	1	04/04/19 12:06	04/04/19 16:21	124-48-1	
1,2-Dibromoethane (EDB)	<6.2	ug/kg	58.8	6.2	1	04/04/19 12:06	04/04/19 16:21	106-93-4	
Dibromomethane	<10.8	ug/kg	58.8	10.8	1	04/04/19 12:06	04/04/19 16:21	74-95-3	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-05 (0-6.5ft)** Lab ID: **10469445005** Collected: 04/02/19 11:15 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,2-Dichlorobenzene	<2.4	ug/kg	58.8	2.4	1	04/04/19 12:06	04/04/19 16:21	95-50-1	
1,3-Dichlorobenzene	<2.1	ug/kg	58.8	2.1	1	04/04/19 12:06	04/04/19 16:21	541-73-1	
1,4-Dichlorobenzene	<3.6	ug/kg	58.8	3.6	1	04/04/19 12:06	04/04/19 16:21	106-46-7	
Dichlorodifluoromethane	<19.0	ug/kg	235	19.0	1	04/04/19 12:06	04/04/19 16:21	75-71-8	
1,1-Dichloroethane	<6.6	ug/kg	58.8	6.6	1	04/04/19 12:06	04/04/19 16:21	75-34-3	
1,2-Dichloroethane	<6.5	ug/kg	58.8	6.5	1	04/04/19 12:06	04/04/19 16:21	107-06-2	
1,1-Dichloroethene	<17.6	ug/kg	58.8	17.6	1	04/04/19 12:06	04/04/19 16:21	75-35-4	
cis-1,2-Dichloroethene	<9.7	ug/kg	58.8	9.7	1	04/04/19 12:06	04/04/19 16:21	156-59-2	
trans-1,2-Dichloroethene	<27.5	ug/kg	58.8	27.5	1	04/04/19 12:06	04/04/19 16:21	156-60-5	
Dichlorofluoromethane	<81.2	ug/kg	588	81.2	1	04/04/19 12:06	04/04/19 16:21	75-43-4	N2
1,2-Dichloropropane	<10.1	ug/kg	58.8	10.1	1	04/04/19 12:06	04/04/19 16:21	78-87-5	
1,3-Dichloropropane	<8.1	ug/kg	58.8	8.1	1	04/04/19 12:06	04/04/19 16:21	142-28-9	
2,2-Dichloropropane	<7.3	ug/kg	235	7.3	1	04/04/19 12:06	04/04/19 16:21	594-20-7	
1,1-Dichloropropene	<27.1	ug/kg	58.8	27.1	1	04/04/19 12:06	04/04/19 16:21	563-58-6	
cis-1,3-Dichloropropene	<8.4	ug/kg	58.8	8.4	1	04/04/19 12:06	04/04/19 16:21	10061-01-5	
trans-1,3-Dichloropropene	<8.2	ug/kg	58.8	8.2	1	04/04/19 12:06	04/04/19 16:21	10061-02-6	
Diethyl ether (Ethyl ether)	<36.0	ug/kg	235	36.0	1	04/04/19 12:06	04/04/19 16:21	60-29-7	
Ethylbenzene	<3.2	ug/kg	58.8	3.2	1	04/04/19 12:06	04/04/19 16:21	100-41-4	
Hexachloro-1,3-butadiene	<14.3	ug/kg	294	14.3	1	04/04/19 12:06	04/04/19 16:21	87-68-3	
Isopropylbenzene (Cumene)	<2.6	ug/kg	58.8	2.6	1	04/04/19 12:06	04/04/19 16:21	98-82-8	
p-Isopropyltoluene	<17.9	ug/kg	58.8	17.9	1	04/04/19 12:06	04/04/19 16:21	99-87-6	
Methylene Chloride	<111	ug/kg	235	111	1	04/04/19 12:06	04/04/19 16:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	<12.2	ug/kg	294	12.2	1	04/04/19 12:06	04/04/19 16:21	108-10-1	
Methyl-tert-butyl ether	<7.0	ug/kg	58.8	7.0	1	04/04/19 12:06	04/04/19 16:21	1634-04-4	
Naphthalene	<55.0	ug/kg	235	55.0	1	04/04/19 12:06	04/04/19 16:21	91-20-3	
n-Propylbenzene	<3.1	ug/kg	58.8	3.1	1	04/04/19 12:06	04/04/19 16:21	103-65-1	
Styrene	<2.7	ug/kg	58.8	2.7	1	04/04/19 12:06	04/04/19 16:21	100-42-5	
1,1,1,2-Tetrachloroethane	<18.5	ug/kg	58.8	18.5	1	04/04/19 12:06	04/04/19 16:21	630-20-6	
1,1,2,2-Tetrachloroethane	<10.4	ug/kg	58.8	10.4	1	04/04/19 12:06	04/04/19 16:21	79-34-5	
Tetrachloroethene	<20.7	ug/kg	58.8	20.7	1	04/04/19 12:06	04/04/19 16:21	127-18-4	
Tetrahydrofuran	<85.4	ug/kg	2350	85.4	1	04/04/19 12:06	04/04/19 16:21	109-99-9	
Toluene	<14.3	ug/kg	58.8	14.3	1	04/04/19 12:06	04/04/19 16:21	108-88-3	
1,2,3-Trichlorobenzene	<9.4	ug/kg	58.8	9.4	1	04/04/19 12:06	04/04/19 16:21	87-61-6	
1,2,4-Trichlorobenzene	<13.0	ug/kg	58.8	13.0	1	04/04/19 12:06	04/04/19 16:21	120-82-1	
1,1,1-Trichloroethane	<27.4	ug/kg	58.8	27.4	1	04/04/19 12:06	04/04/19 16:21	71-55-6	
1,1,2-Trichloroethane	<7.0	ug/kg	58.8	7.0	1	04/04/19 12:06	04/04/19 16:21	79-00-5	
Trichloroethene	<9.1	ug/kg	58.8	9.1	1	04/04/19 12:06	04/04/19 16:21	79-01-6	
Trichlorofluoromethane	<102	ug/kg	235	102	1	04/04/19 12:06	04/04/19 16:21	75-69-4	
1,2,3-Trichloropropane	<15.4	ug/kg	235	15.4	1	04/04/19 12:06	04/04/19 16:21	96-18-4	
1,1,2-Trichlorotrifluoroethane	<68.2	ug/kg	235	68.2	1	04/04/19 12:06	04/04/19 16:21	76-13-1	
1,2,4-Trimethylbenzene	<11.8	ug/kg	58.8	11.8	1	04/04/19 12:06	04/04/19 16:21	95-63-6	
1,3,5-Trimethylbenzene	<9.4	ug/kg	58.8	9.4	1	04/04/19 12:06	04/04/19 16:21	108-67-8	
Vinyl chloride	<11.6	ug/kg	23.5	11.6	1	04/04/19 12:06	04/04/19 16:21	75-01-4	
Xylene (Total)	<13.6	ug/kg	176	13.6	1	04/04/19 12:06	04/04/19 16:21	1330-20-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-05 (0-6.5ft) **Lab ID: 10469445005** Collected: 04/02/19 11:15 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Surrogates									
1,2-Dichloroethane-d4 (S)	107	%	75-125		1	04/04/19 12:06	04/04/19 16:21	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1	04/04/19 12:06	04/04/19 16:21	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/04/19 12:06	04/04/19 16:21	460-00-4	

Sample: FL-SB-06 (0-4.5ft) **Lab ID: 10469445006** Collected: 04/02/19 11:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	18.8	mg/kg	10.0	2.6	1	04/04/19 08:23	04/05/19 14:27		T6
Surrogates									
n-Triacontane (S)	89	%	50-150		1	04/04/19 08:23	04/05/19 14:27	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	<1.5	mg/kg	11.6	1.5	1	04/11/19 13:33	04/12/19 04:44		
Surrogates									
a,a,a-Trifluorotoluene (S)	101	%	80-150		1	04/11/19 13:33	04/12/19 04:44	98-08-8	
6010D MET ICP		Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Barium	63.2	mg/kg	0.56	0.047	1	04/05/19 11:58	04/09/19 13:36	7440-39-3	
Silver	<0.041	mg/kg	0.56	0.041	1	04/05/19 11:58	04/09/19 13:36	7440-22-4	
6020B MET ICPMS		Analytical Method: EPA 6020B Preparation Method: EPA 3050							
Arsenic	3.4	mg/kg	0.55	0.19	20	04/05/19 11:58	04/16/19 00:09	7440-38-2	
Cadmium	0.21	mg/kg	0.088	0.029	20	04/05/19 11:58	04/16/19 00:09	7440-43-9	
Chromium	9.7	mg/kg	0.55	0.14	20	04/05/19 11:58	04/16/19 00:09	7440-47-3	
Lead	7.0	mg/kg	0.22	0.063	20	04/05/19 11:58	04/16/19 00:09	7439-92-1	
Selenium	1.0	mg/kg	0.55	0.16	20	04/05/19 11:58	04/16/19 00:09	7782-49-2	
7471B Mercury		Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	0.020J	mg/kg	0.021	0.0085	1	04/05/19 12:48	04/15/19 13:21	7439-97-6	
Dry Weight / %M by ASTM D2974		Analytical Method: ASTM D2974							
Percent Moisture	13.8	%	0.10	0.10	1		04/05/19 13:32		
8270D MSSV PAH by SIM		Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	<0.47	ug/kg	11.6	0.47	1	04/04/19 09:08	04/08/19 13:25	83-32-9	
Acenaphthylene	<0.57	ug/kg	11.6	0.57	1	04/04/19 09:08	04/08/19 13:25	208-96-8	
Anthracene	<0.54	ug/kg	11.6	0.54	1	04/04/19 09:08	04/08/19 13:25	120-12-7	
Benzo(a)anthracene	18.5	ug/kg	11.6	1.2	1	04/04/19 09:08	04/08/19 13:25	56-55-3	
Benzo(a)pyrene	21.3	ug/kg	11.6	0.79	1	04/04/19 09:08	04/08/19 13:25	50-32-8	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-06 (0-4.5ft) **Lab ID: 10469445006** Collected: 04/02/19 11:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Benzo(b)fluoranthene	27.0	ug/kg	11.6	0.43	1	04/04/19 09:08	04/08/19 13:25	205-99-2	
Benzo(e)pyrene	14.6	ug/kg	11.6	0.83	1	04/04/19 09:08	04/08/19 13:25	192-97-2	N2
Benzo(g,h,i)perylene	17.3	ug/kg	11.6	0.73	1	04/04/19 09:08	04/08/19 13:25	191-24-2	
Benzo(k)fluoranthene	16.1	ug/kg	11.6	0.98	1	04/04/19 09:08	04/08/19 13:25	207-08-9	
Chrysene	22.5	ug/kg	11.6	1.6	1	04/04/19 09:08	04/08/19 13:25	218-01-9	
Dibenz(a,h)anthracene	<0.53	ug/kg	11.6	0.53	1	04/04/19 09:08	04/08/19 13:25	53-70-3	
Fluoranthene	41.2	ug/kg	11.6	0.50	1	04/04/19 09:08	04/08/19 13:25	206-44-0	
Fluorene	2.5J	ug/kg	11.6	0.36	1	04/04/19 09:08	04/08/19 13:25	86-73-7	
Indeno(1,2,3-cd)pyrene	12.4	ug/kg	11.6	0.77	1	04/04/19 09:08	04/08/19 13:25	193-39-5	
Naphthalene	<0.89	ug/kg	11.6	0.89	1	04/04/19 09:08	04/08/19 13:25	91-20-3	
Phenanthrene	19.6	ug/kg	11.6	2.2	1	04/04/19 09:08	04/08/19 13:25	85-01-8	
Pyrene	34.4	ug/kg	11.6	1.8	1	04/04/19 09:08	04/08/19 13:25	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	83	%	30-125		1	04/04/19 09:08	04/08/19 13:25	321-60-8	
p-Terphenyl-d14 (S)	78	%	30-125		1	04/04/19 09:08	04/08/19 13:25	1718-51-0	

8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	<380	ug/kg	1220	380	1	04/04/19 12:06	04/04/19 16:39	67-64-1	
Allyl chloride	<51.2	ug/kg	244	51.2	1	04/04/19 12:06	04/04/19 16:39	107-05-1	
Benzene	<3.4	ug/kg	24.4	3.4	1	04/04/19 12:06	04/04/19 16:39	71-43-2	
Bromobenzene	<3.8	ug/kg	61.1	3.8	1	04/04/19 12:06	04/04/19 16:39	108-86-1	
Bromochloromethane	<21.1	ug/kg	61.1	21.1	1	04/04/19 12:06	04/04/19 16:39	74-97-5	
Bromodichloromethane	<20.9	ug/kg	61.1	20.9	1	04/04/19 12:06	04/04/19 16:39	75-27-4	
Bromoform	<92.5	ug/kg	244	92.5	1	04/04/19 12:06	04/04/19 16:39	75-25-2	
Bromomethane	<71.5	ug/kg	611	71.5	1	04/04/19 12:06	04/04/19 16:39	74-83-9	
2-Butanone (MEK)	<32.5	ug/kg	306	32.5	1	04/04/19 12:06	04/04/19 16:39	78-93-3	
n-Butylbenzene	<29.1	ug/kg	61.1	29.1	1	04/04/19 12:06	04/04/19 16:39	104-51-8	
sec-Butylbenzene	<11.7	ug/kg	61.1	11.7	1	04/04/19 12:06	04/04/19 16:39	135-98-8	
tert-Butylbenzene	<11.7	ug/kg	61.1	11.7	1	04/04/19 12:06	04/04/19 16:39	98-06-6	
Carbon tetrachloride	<29.2	ug/kg	244	29.2	1	04/04/19 12:06	04/04/19 16:39	56-23-5	
Chlorobenzene	<3.4	ug/kg	61.1	3.4	1	04/04/19 12:06	04/04/19 16:39	108-90-7	
Chloroethane	<31.8	ug/kg	611	31.8	1	04/04/19 12:06	04/04/19 16:39	75-00-3	
Chloroform	<30.6	ug/kg	61.1	30.6	1	04/04/19 12:06	04/04/19 16:39	67-66-3	
Chloromethane	<14.7	ug/kg	244	14.7	1	04/04/19 12:06	04/04/19 16:39	74-87-3	
2-Chlorotoluene	<3.0	ug/kg	61.1	3.0	1	04/04/19 12:06	04/04/19 16:39	95-49-8	
4-Chlorotoluene	<3.1	ug/kg	61.1	3.1	1	04/04/19 12:06	04/04/19 16:39	106-43-4	
1,2-Dibromo-3-chloropropane	<213	ug/kg	611	213	1	04/04/19 12:06	04/04/19 16:39	96-12-8	
Dibromochloromethane	<7.1	ug/kg	244	7.1	1	04/04/19 12:06	04/04/19 16:39	124-48-1	
1,2-Dibromoethane (EDB)	<6.4	ug/kg	61.1	6.4	1	04/04/19 12:06	04/04/19 16:39	106-93-4	
Dibromomethane	<11.2	ug/kg	61.1	11.2	1	04/04/19 12:06	04/04/19 16:39	74-95-3	
1,2-Dichlorobenzene	<2.5	ug/kg	61.1	2.5	1	04/04/19 12:06	04/04/19 16:39	95-50-1	
1,3-Dichlorobenzene	<2.2	ug/kg	61.1	2.2	1	04/04/19 12:06	04/04/19 16:39	541-73-1	
1,4-Dichlorobenzene	<3.8	ug/kg	61.1	3.8	1	04/04/19 12:06	04/04/19 16:39	106-46-7	
Dichlorodifluoromethane	<19.8	ug/kg	244	19.8	1	04/04/19 12:06	04/04/19 16:39	75-71-8	
1,1-Dichloroethane	<6.9	ug/kg	61.1	6.9	1	04/04/19 12:06	04/04/19 16:39	75-34-3	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-06 (0-4.5ft)** Lab ID: **10469445006** Collected: 04/02/19 11:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,2-Dichloroethane	<6.7	ug/kg	61.1	6.7	1	04/04/19 12:06	04/04/19 16:39	107-06-2	
1,1-Dichloroethene	<18.3	ug/kg	61.1	18.3	1	04/04/19 12:06	04/04/19 16:39	75-35-4	
cis-1,2-Dichloroethene	<10.1	ug/kg	61.1	10.1	1	04/04/19 12:06	04/04/19 16:39	156-59-2	
trans-1,2-Dichloroethene	<28.6	ug/kg	61.1	28.6	1	04/04/19 12:06	04/04/19 16:39	156-60-5	
Dichlorofluoromethane	<84.5	ug/kg	611	84.5	1	04/04/19 12:06	04/04/19 16:39	75-43-4	N2
1,2-Dichloropropane	<10.5	ug/kg	61.1	10.5	1	04/04/19 12:06	04/04/19 16:39	78-87-5	
1,3-Dichloropropane	<8.5	ug/kg	61.1	8.5	1	04/04/19 12:06	04/04/19 16:39	142-28-9	
2,2-Dichloropropane	<7.6	ug/kg	244	7.6	1	04/04/19 12:06	04/04/19 16:39	594-20-7	
1,1-Dichloropropene	<28.2	ug/kg	61.1	28.2	1	04/04/19 12:06	04/04/19 16:39	563-58-6	
cis-1,3-Dichloropropene	<8.8	ug/kg	61.1	8.8	1	04/04/19 12:06	04/04/19 16:39	10061-01-5	
trans-1,3-Dichloropropene	<8.5	ug/kg	61.1	8.5	1	04/04/19 12:06	04/04/19 16:39	10061-02-6	
Diethyl ether (Ethyl ether)	<37.4	ug/kg	244	37.4	1	04/04/19 12:06	04/04/19 16:39	60-29-7	
Ethylbenzene	<3.3	ug/kg	61.1	3.3	1	04/04/19 12:06	04/04/19 16:39	100-41-4	
Hexachloro-1,3-butadiene	<14.9	ug/kg	306	14.9	1	04/04/19 12:06	04/04/19 16:39	87-68-3	
Isopropylbenzene (Cumene)	<2.7	ug/kg	61.1	2.7	1	04/04/19 12:06	04/04/19 16:39	98-82-8	
p-Isopropyltoluene	<18.6	ug/kg	61.1	18.6	1	04/04/19 12:06	04/04/19 16:39	99-87-6	
Methylene Chloride	<115	ug/kg	244	115	1	04/04/19 12:06	04/04/19 16:39	75-09-2	
4-Methyl-2-pentanone (MIBK)	<12.7	ug/kg	306	12.7	1	04/04/19 12:06	04/04/19 16:39	108-10-1	
Methyl-tert-butyl ether	<7.3	ug/kg	61.1	7.3	1	04/04/19 12:06	04/04/19 16:39	1634-04-4	
Naphthalene	<57.2	ug/kg	244	57.2	1	04/04/19 12:06	04/04/19 16:39	91-20-3	
n-Propylbenzene	<3.3	ug/kg	61.1	3.3	1	04/04/19 12:06	04/04/19 16:39	103-65-1	
Styrene	<2.8	ug/kg	61.1	2.8	1	04/04/19 12:06	04/04/19 16:39	100-42-5	
1,1,1,2-Tetrachloroethane	<19.2	ug/kg	61.1	19.2	1	04/04/19 12:06	04/04/19 16:39	630-20-6	
1,1,2,2-Tetrachloroethane	<10.8	ug/kg	61.1	10.8	1	04/04/19 12:06	04/04/19 16:39	79-34-5	
Tetrachloroethene	<21.5	ug/kg	61.1	21.5	1	04/04/19 12:06	04/04/19 16:39	127-18-4	
Tetrahydrofuran	<88.9	ug/kg	2440	88.9	1	04/04/19 12:06	04/04/19 16:39	109-99-9	
Toluene	<14.9	ug/kg	61.1	14.9	1	04/04/19 12:06	04/04/19 16:39	108-88-3	
1,2,3-Trichlorobenzene	<9.8	ug/kg	61.1	9.8	1	04/04/19 12:06	04/04/19 16:39	87-61-6	
1,2,4-Trichlorobenzene	<13.6	ug/kg	61.1	13.6	1	04/04/19 12:06	04/04/19 16:39	120-82-1	
1,1,1-Trichloroethane	<28.5	ug/kg	61.1	28.5	1	04/04/19 12:06	04/04/19 16:39	71-55-6	
1,1,2-Trichloroethane	<7.3	ug/kg	61.1	7.3	1	04/04/19 12:06	04/04/19 16:39	79-00-5	
Trichloroethene	<9.4	ug/kg	61.1	9.4	1	04/04/19 12:06	04/04/19 16:39	79-01-6	
Trichlorofluoromethane	<107	ug/kg	244	107	1	04/04/19 12:06	04/04/19 16:39	75-69-4	
1,2,3-Trichloropropane	<16.0	ug/kg	244	16.0	1	04/04/19 12:06	04/04/19 16:39	96-18-4	
1,1,2-Trichlorotrifluoroethane	<70.9	ug/kg	244	70.9	1	04/04/19 12:06	04/04/19 16:39	76-13-1	
1,2,4-Trimethylbenzene	<12.2	ug/kg	61.1	12.2	1	04/04/19 12:06	04/04/19 16:39	95-63-6	
1,3,5-Trimethylbenzene	<9.7	ug/kg	61.1	9.7	1	04/04/19 12:06	04/04/19 16:39	108-67-8	
Vinyl chloride	<12.0	ug/kg	24.4	12.0	1	04/04/19 12:06	04/04/19 16:39	75-01-4	
Xylene (Total)	<14.2	ug/kg	183	14.2	1	04/04/19 12:06	04/04/19 16:39	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	106	%	75-125		1	04/04/19 12:06	04/04/19 16:39	17060-07-0	
Toluene-d8 (S)	104	%	75-125		1	04/04/19 12:06	04/04/19 16:39	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1	04/04/19 12:06	04/04/19 16:39	460-00-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Project No.: 10469445

Sample: FL-SB-07 (0-4.5ft) **Lab ID: 10469445007** Collected: 04/02/19 12:20 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	35.4	mg/kg	19.6	5.1	2	04/04/19 08:23	04/05/19 14:14		T6
Surrogates									
n-Triacontane (S)	116	%	50-150		2	04/04/19 08:23	04/05/19 14:14	638-68-6	
WIGRO GCV Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	2.7J	mg/kg	13.6	1.7	1	04/12/19 15:21	04/12/19 23:35		
Surrogates									
a,a,a-Trifluorotoluene (S)	94	%	80-150		1	04/12/19 15:21	04/12/19 23:35	98-08-8	
6010D MET ICP Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	67.1	mg/kg	0.58	0.048	1	04/05/19 11:58	04/09/19 13:39	7440-39-3	
Silver	<0.042	mg/kg	0.58	0.042	1	04/05/19 11:58	04/09/19 13:39	7440-22-4	
6020B MET ICPMS Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	4.5	mg/kg	0.59	0.21	20	04/05/19 11:58	04/16/19 00:13	7440-38-2	
Cadmium	0.81	mg/kg	0.094	0.031	20	04/05/19 11:58	04/16/19 00:13	7440-43-9	
Chromium	14.7	mg/kg	0.59	0.15	20	04/05/19 11:58	04/16/19 00:13	7440-47-3	
Lead	26.2	mg/kg	0.23	0.067	20	04/05/19 11:58	04/16/19 00:13	7439-92-1	
Selenium	1.3	mg/kg	0.59	0.17	20	04/05/19 11:58	04/16/19 00:13	7782-49-2	
7471B Mercury Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.036	mg/kg	0.022	0.0090	1	04/05/19 12:48	04/15/19 13:27	7439-97-6	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974									
Percent Moisture	16.4	%	0.10	0.10	1		04/05/19 13:32		
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<2.4	ug/kg	59.4	2.4	5	04/04/19 09:08	04/05/19 20:06	83-32-9	
Acenaphthylene	<2.9	ug/kg	59.4	2.9	5	04/04/19 09:08	04/05/19 20:06	208-96-8	
Anthracene	175	ug/kg	59.4	2.8	5	04/04/19 09:08	04/05/19 20:06	120-12-7	
Benzo(a)anthracene	953	ug/kg	59.4	6.4	5	04/04/19 09:08	04/05/19 20:06	56-55-3	
Benzo(a)pyrene	1100	ug/kg	59.4	4.1	5	04/04/19 09:08	04/05/19 20:06	50-32-8	
Benzo(b)fluoranthene	1230	ug/kg	59.4	2.2	5	04/04/19 09:08	04/05/19 20:06	205-99-2	
Benzo(e)pyrene	779	ug/kg	59.4	4.3	5	04/04/19 09:08	04/05/19 20:06	192-97-2	N2
Benzo(g,h,i)perylene	858	ug/kg	59.4	3.8	5	04/04/19 09:08	04/05/19 20:06	191-24-2	
Benzo(k)fluoranthene	507	ug/kg	59.4	5.0	5	04/04/19 09:08	04/05/19 20:06	207-08-9	
Chrysene	989	ug/kg	59.4	8.1	5	04/04/19 09:08	04/05/19 20:06	218-01-9	
Dibenz(a,h)anthracene	228	ug/kg	59.4	2.7	5	04/04/19 09:08	04/05/19 20:06	53-70-3	
Fluoranthene	1420	ug/kg	59.4	2.5	5	04/04/19 09:08	04/05/19 20:06	206-44-0	
Fluorene	<1.9	ug/kg	59.4	1.9	5	04/04/19 09:08	04/05/19 20:06	86-73-7	
Indeno(1,2,3-cd)pyrene	645	ug/kg	59.4	4.0	5	04/04/19 09:08	04/05/19 20:06	193-39-5	
Naphthalene	<4.6	ug/kg	59.4	4.6	5	04/04/19 09:08	04/05/19 20:06	91-20-3	
Phenanthrene	514	ug/kg	59.4	11.4	5	04/04/19 09:08	04/05/19 20:06	85-01-8	
Pyrene	1220	ug/kg	59.4	9.1	5	04/04/19 09:08	04/05/19 20:06	129-00-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-07 (0-4.5ft)** Lab ID: **10469445007** Collected: 04/02/19 12:20 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Surrogates									
2-Fluorobiphenyl (S)	82	%	30-125		5	04/04/19 09:08	04/05/19 20:06	321-60-8	
p-Terphenyl-d14 (S)	80	%	30-125		5	04/04/19 09:08	04/05/19 20:06	1718-51-0	
8260B MSV 5030 Med Level Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<403	ug/kg	1300	403	1	04/04/19 12:06	04/04/19 16:57	67-64-1	
Allyl chloride	<54.3	ug/kg	259	54.3	1	04/04/19 12:06	04/04/19 16:57	107-05-1	
Benzene	<3.7	ug/kg	25.9	3.7	1	04/04/19 12:06	04/04/19 16:57	71-43-2	
Bromobenzene	<4.0	ug/kg	64.8	4.0	1	04/04/19 12:06	04/04/19 16:57	108-86-1	
Bromochloromethane	<22.4	ug/kg	64.8	22.4	1	04/04/19 12:06	04/04/19 16:57	74-97-5	
Bromodichloromethane	<22.2	ug/kg	64.8	22.2	1	04/04/19 12:06	04/04/19 16:57	75-27-4	
Bromoform	<98.1	ug/kg	259	98.1	1	04/04/19 12:06	04/04/19 16:57	75-25-2	
Bromomethane	<75.8	ug/kg	648	75.8	1	04/04/19 12:06	04/04/19 16:57	74-83-9	
2-Butanone (MEK)	<34.5	ug/kg	324	34.5	1	04/04/19 12:06	04/04/19 16:57	78-93-3	
n-Butylbenzene	<30.8	ug/kg	64.8	30.8	1	04/04/19 12:06	04/04/19 16:57	104-51-8	
sec-Butylbenzene	<12.4	ug/kg	64.8	12.4	1	04/04/19 12:06	04/04/19 16:57	135-98-8	
tert-Butylbenzene	<12.4	ug/kg	64.8	12.4	1	04/04/19 12:06	04/04/19 16:57	98-06-6	
Carbon tetrachloride	<31.0	ug/kg	259	31.0	1	04/04/19 12:06	04/04/19 16:57	56-23-5	
Chlorobenzene	<3.7	ug/kg	64.8	3.7	1	04/04/19 12:06	04/04/19 16:57	108-90-7	
Chloroethane	<33.7	ug/kg	648	33.7	1	04/04/19 12:06	04/04/19 16:57	75-00-3	
Chloroform	<32.4	ug/kg	64.8	32.4	1	04/04/19 12:06	04/04/19 16:57	67-66-3	
Chloromethane	<15.5	ug/kg	259	15.5	1	04/04/19 12:06	04/04/19 16:57	74-87-3	
2-Chlorotoluene	<3.2	ug/kg	64.8	3.2	1	04/04/19 12:06	04/04/19 16:57	95-49-8	
4-Chlorotoluene	<3.3	ug/kg	64.8	3.3	1	04/04/19 12:06	04/04/19 16:57	106-43-4	
1,2-Dibromo-3-chloropropane	<225	ug/kg	648	225	1	04/04/19 12:06	04/04/19 16:57	96-12-8	
Dibromochloromethane	<7.5	ug/kg	259	7.5	1	04/04/19 12:06	04/04/19 16:57	124-48-1	
1,2-Dibromoethane (EDB)	<6.8	ug/kg	64.8	6.8	1	04/04/19 12:06	04/04/19 16:57	106-93-4	
Dibromomethane	<11.9	ug/kg	64.8	11.9	1	04/04/19 12:06	04/04/19 16:57	74-95-3	
1,2-Dichlorobenzene	<2.6	ug/kg	64.8	2.6	1	04/04/19 12:06	04/04/19 16:57	95-50-1	
1,3-Dichlorobenzene	<2.4	ug/kg	64.8	2.4	1	04/04/19 12:06	04/04/19 16:57	541-73-1	
1,4-Dichlorobenzene	<4.0	ug/kg	64.8	4.0	1	04/04/19 12:06	04/04/19 16:57	106-46-7	
Dichlorodifluoromethane	<21.0	ug/kg	259	21.0	1	04/04/19 12:06	04/04/19 16:57	75-71-8	
1,1-Dichloroethane	<7.3	ug/kg	64.8	7.3	1	04/04/19 12:06	04/04/19 16:57	75-34-3	
1,2-Dichloroethane	<7.1	ug/kg	64.8	7.1	1	04/04/19 12:06	04/04/19 16:57	107-06-2	
1,1-Dichloroethene	<19.4	ug/kg	64.8	19.4	1	04/04/19 12:06	04/04/19 16:57	75-35-4	
cis-1,2-Dichloroethene	<10.7	ug/kg	64.8	10.7	1	04/04/19 12:06	04/04/19 16:57	156-59-2	
trans-1,2-Dichloroethene	<30.3	ug/kg	64.8	30.3	1	04/04/19 12:06	04/04/19 16:57	156-60-5	
Dichlorofluoromethane	<89.5	ug/kg	648	89.5	1	04/04/19 12:06	04/04/19 16:57	75-43-4	N2
1,2-Dichloropropane	<11.2	ug/kg	64.8	11.2	1	04/04/19 12:06	04/04/19 16:57	78-87-5	
1,3-Dichloropropane	<9.0	ug/kg	64.8	9.0	1	04/04/19 12:06	04/04/19 16:57	142-28-9	
2,2-Dichloropropane	<8.1	ug/kg	259	8.1	1	04/04/19 12:06	04/04/19 16:57	594-20-7	
1,1-Dichloropropene	<29.9	ug/kg	64.8	29.9	1	04/04/19 12:06	04/04/19 16:57	563-58-6	
cis-1,3-Dichloropropene	<9.3	ug/kg	64.8	9.3	1	04/04/19 12:06	04/04/19 16:57	10061-01-5	
trans-1,3-Dichloropropene	<9.0	ug/kg	64.8	9.0	1	04/04/19 12:06	04/04/19 16:57	10061-02-6	
Diethyl ether (Ethyl ether)	<39.6	ug/kg	259	39.6	1	04/04/19 12:06	04/04/19 16:57	60-29-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-07 (0-4.5ft) **Lab ID: 10469445007** Collected: 04/02/19 12:20 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Ethylbenzene	<3.5	ug/kg	64.8	3.5	1	04/04/19 12:06	04/04/19 16:57	100-41-4	
Hexachloro-1,3-butadiene	<15.8	ug/kg	324	15.8	1	04/04/19 12:06	04/04/19 16:57	87-68-3	
Isopropylbenzene (Cumene)	<2.9	ug/kg	64.8	2.9	1	04/04/19 12:06	04/04/19 16:57	98-82-8	
p-Isopropyltoluene	<19.7	ug/kg	64.8	19.7	1	04/04/19 12:06	04/04/19 16:57	99-87-6	
Methylene Chloride	<122	ug/kg	259	122	1	04/04/19 12:06	04/04/19 16:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	<13.5	ug/kg	324	13.5	1	04/04/19 12:06	04/04/19 16:57	108-10-1	
Methyl-tert-butyl ether	<7.7	ug/kg	64.8	7.7	1	04/04/19 12:06	04/04/19 16:57	1634-04-4	
Naphthalene	<60.6	ug/kg	259	60.6	1	04/04/19 12:06	04/04/19 16:57	91-20-3	
n-Propylbenzene	<3.5	ug/kg	64.8	3.5	1	04/04/19 12:06	04/04/19 16:57	103-65-1	
Styrene	<3.0	ug/kg	64.8	3.0	1	04/04/19 12:06	04/04/19 16:57	100-42-5	
1,1,1,2-Tetrachloroethane	<20.3	ug/kg	64.8	20.3	1	04/04/19 12:06	04/04/19 16:57	630-20-6	
1,1,2,2-Tetrachloroethane	<11.4	ug/kg	64.8	11.4	1	04/04/19 12:06	04/04/19 16:57	79-34-5	
Tetrachloroethene	<22.8	ug/kg	64.8	22.8	1	04/04/19 12:06	04/04/19 16:57	127-18-4	
Tetrahydrofuran	<94.2	ug/kg	2590	94.2	1	04/04/19 12:06	04/04/19 16:57	109-99-9	
Toluene	<15.8	ug/kg	64.8	15.8	1	04/04/19 12:06	04/04/19 16:57	108-88-3	
1,2,3-Trichlorobenzene	<10.4	ug/kg	64.8	10.4	1	04/04/19 12:06	04/04/19 16:57	87-61-6	
1,2,4-Trichlorobenzene	<14.4	ug/kg	64.8	14.4	1	04/04/19 12:06	04/04/19 16:57	120-82-1	
1,1,1-Trichloroethane	<30.2	ug/kg	64.8	30.2	1	04/04/19 12:06	04/04/19 16:57	71-55-6	
1,1,2-Trichloroethane	<7.7	ug/kg	64.8	7.7	1	04/04/19 12:06	04/04/19 16:57	79-00-5	
Trichloroethene	<10	ug/kg	64.8	10	1	04/04/19 12:06	04/04/19 16:57	79-01-6	
Trichlorofluoromethane	<113	ug/kg	259	113	1	04/04/19 12:06	04/04/19 16:57	75-69-4	
1,2,3-Trichloropropane	<17.0	ug/kg	259	17.0	1	04/04/19 12:06	04/04/19 16:57	96-18-4	
1,1,2-Trichlorotrifluoroethane	<75.1	ug/kg	259	75.1	1	04/04/19 12:06	04/04/19 16:57	76-13-1	
1,2,4-Trimethylbenzene	<13.0	ug/kg	64.8	13.0	1	04/04/19 12:06	04/04/19 16:57	95-63-6	
1,3,5-Trimethylbenzene	<10.3	ug/kg	64.8	10.3	1	04/04/19 12:06	04/04/19 16:57	108-67-8	
Vinyl chloride	<12.7	ug/kg	25.9	12.7	1	04/04/19 12:06	04/04/19 16:57	75-01-4	
Xylene (Total)	<15.0	ug/kg	194	15.0	1	04/04/19 12:06	04/04/19 16:57	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	107	%	75-125		1	04/04/19 12:06	04/04/19 16:57	17060-07-0	
Toluene-d8 (S)	104	%	75-125		1	04/04/19 12:06	04/04/19 16:57	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125		1	04/04/19 12:06	04/04/19 16:57	460-00-4	

Sample: FL-SB-08 (0-5ft) **Lab ID: 10469445008** Collected: 04/02/19 13:20 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	27.9	mg/kg	11.6	3.0	1	04/04/19 17:58	04/06/19 12:29		T6
Surrogates									
n-Triacontane (S)	96	%	50-150		1	04/04/19 17:58	04/06/19 12:29	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	<1.7	mg/kg	13.5	1.7	1	04/12/19 15:21	04/13/19 01:35		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-08 (0-5ft) **Lab ID: 10469445008** Collected: 04/02/19 13:20 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Surrogates									
a,a,a-Trifluorotoluene (S)	95	%	80-150		1	04/12/19 15:21	04/13/19 01:35	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	93.5	mg/kg	0.63	0.052	1	04/05/19 11:58	04/09/19 13:42	7440-39-3	
Silver	0.061J	mg/kg	0.63	0.046	1	04/05/19 11:58	04/09/19 13:42	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	6.5	mg/kg	0.63	0.22	20	04/05/19 11:58	04/16/19 00:18	7440-38-2	
Cadmium	5.2	mg/kg	0.10	0.033	20	04/05/19 11:58	04/16/19 00:18	7440-43-9	
Chromium	20.3	mg/kg	0.63	0.16	20	04/05/19 11:58	04/16/19 00:18	7440-47-3	
Lead	29.9	mg/kg	0.25	0.072	20	04/05/19 11:58	04/16/19 00:18	7439-92-1	
Selenium	1.8	mg/kg	0.63	0.18	20	04/05/19 11:58	04/16/19 00:18	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.056	mg/kg	0.025	0.0099	1	04/05/19 12:48	04/15/19 13:29	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	21.1	%	0.10	0.10	1		04/05/19 13:33		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<0.52	ug/kg	12.7	0.52	1	04/04/19 09:08	04/08/19 13:46	83-32-9	
Acenaphthylene	<0.63	ug/kg	12.7	0.63	1	04/04/19 09:08	04/08/19 13:46	208-96-8	
Anthracene	14.4	ug/kg	12.7	0.59	1	04/04/19 09:08	04/08/19 13:46	120-12-7	
Benzo(a)anthracene	55.7	ug/kg	12.7	1.4	1	04/04/19 09:08	04/08/19 13:46	56-55-3	
Benzo(a)pyrene	88.3	ug/kg	12.7	0.87	1	04/04/19 09:08	04/08/19 13:46	50-32-8	
Benzo(b)fluoranthene	99.8	ug/kg	12.7	0.47	1	04/04/19 09:08	04/08/19 13:46	205-99-2	
Benzo(e)pyrene	69.4	ug/kg	12.7	0.91	1	04/04/19 09:08	04/08/19 13:46	192-97-2	N2
Benzo(g,h,i)perylene	75.8	ug/kg	12.7	0.80	1	04/04/19 09:08	04/08/19 13:46	191-24-2	
Benzo(k)fluoranthene	58.2	ug/kg	12.7	1.1	1	04/04/19 09:08	04/08/19 13:46	207-08-9	
Chrysene	79.9	ug/kg	12.7	1.7	1	04/04/19 09:08	04/08/19 13:46	218-01-9	
Dibenz(a,h)anthracene	<0.58	ug/kg	12.7	0.58	1	04/04/19 09:08	04/08/19 13:46	53-70-3	
Fluoranthene	145	ug/kg	12.7	0.54	1	04/04/19 09:08	04/08/19 13:46	206-44-0	
Fluorene	<0.40	ug/kg	12.7	0.40	1	04/04/19 09:08	04/08/19 13:46	86-73-7	
Indeno(1,2,3-cd)pyrene	51.5	ug/kg	12.7	0.85	1	04/04/19 09:08	04/08/19 13:46	193-39-5	
Naphthalene	<0.98	ug/kg	12.7	0.98	1	04/04/19 09:08	04/08/19 13:46	91-20-3	
Phenanthrene	50.9	ug/kg	12.7	2.4	1	04/04/19 09:08	04/08/19 13:46	85-01-8	
Pyrene	120	ug/kg	12.7	1.9	1	04/04/19 09:08	04/08/19 13:46	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	73	%	30-125		1	04/04/19 09:08	04/08/19 13:46	321-60-8	
p-Terphenyl-d14 (S)	63	%	30-125		1	04/04/19 09:08	04/08/19 13:46	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<432	ug/kg	1390	432	1	04/04/19 12:06	04/04/19 17:15	67-64-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-08 (0-5ft) **Lab ID: 10469445008** Collected: 04/02/19 13:20 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Allyl chloride	<58.2	ug/kg	278	58.2	1	04/04/19 12:06	04/04/19 17:15	107-05-1	
Benzene	<3.9	ug/kg	27.8	3.9	1	04/04/19 12:06	04/04/19 17:15	71-43-2	
Bromobenzene	<4.3	ug/kg	69.5	4.3	1	04/04/19 12:06	04/04/19 17:15	108-86-1	
Bromochloromethane	<24.0	ug/kg	69.5	24.0	1	04/04/19 12:06	04/04/19 17:15	74-97-5	
Bromodichloromethane	<23.8	ug/kg	69.5	23.8	1	04/04/19 12:06	04/04/19 17:15	75-27-4	
Bromoform	<105	ug/kg	278	105	1	04/04/19 12:06	04/04/19 17:15	75-25-2	
Bromomethane	<81.3	ug/kg	695	81.3	1	04/04/19 12:06	04/04/19 17:15	74-83-9	
2-Butanone (MEK)	<37.0	ug/kg	347	37.0	1	04/04/19 12:06	04/04/19 17:15	78-93-3	
n-Butylbenzene	<33.1	ug/kg	69.5	33.1	1	04/04/19 12:06	04/04/19 17:15	104-51-8	
sec-Butylbenzene	<13.3	ug/kg	69.5	13.3	1	04/04/19 12:06	04/04/19 17:15	135-98-8	
tert-Butylbenzene	<13.3	ug/kg	69.5	13.3	1	04/04/19 12:06	04/04/19 17:15	98-06-6	
Carbon tetrachloride	<33.2	ug/kg	278	33.2	1	04/04/19 12:06	04/04/19 17:15	56-23-5	
Chlorobenzene	<3.9	ug/kg	69.5	3.9	1	04/04/19 12:06	04/04/19 17:15	108-90-7	
Chloroethane	<36.1	ug/kg	695	36.1	1	04/04/19 12:06	04/04/19 17:15	75-00-3	
Chloroform	<34.7	ug/kg	69.5	34.7	1	04/04/19 12:06	04/04/19 17:15	67-66-3	
Chloromethane	<16.7	ug/kg	278	16.7	1	04/04/19 12:06	04/04/19 17:15	74-87-3	
2-Chlorotoluene	<3.4	ug/kg	69.5	3.4	1	04/04/19 12:06	04/04/19 17:15	95-49-8	
4-Chlorotoluene	<3.6	ug/kg	69.5	3.6	1	04/04/19 12:06	04/04/19 17:15	106-43-4	
1,2-Dibromo-3-chloropropane	<242	ug/kg	695	242	1	04/04/19 12:06	04/04/19 17:15	96-12-8	
Dibromochloromethane	<8.1	ug/kg	278	8.1	1	04/04/19 12:06	04/04/19 17:15	124-48-1	
1,2-Dibromoethane (EDB)	<7.3	ug/kg	69.5	7.3	1	04/04/19 12:06	04/04/19 17:15	106-93-4	
Dibromomethane	<12.7	ug/kg	69.5	12.7	1	04/04/19 12:06	04/04/19 17:15	74-95-3	
1,2-Dichlorobenzene	<2.8	ug/kg	69.5	2.8	1	04/04/19 12:06	04/04/19 17:15	95-50-1	
1,3-Dichlorobenzene	<2.5	ug/kg	69.5	2.5	1	04/04/19 12:06	04/04/19 17:15	541-73-1	
1,4-Dichlorobenzene	<4.3	ug/kg	69.5	4.3	1	04/04/19 12:06	04/04/19 17:15	106-46-7	
Dichlorodifluoromethane	<22.5	ug/kg	278	22.5	1	04/04/19 12:06	04/04/19 17:15	75-71-8	
1,1-Dichloroethane	<7.8	ug/kg	69.5	7.8	1	04/04/19 12:06	04/04/19 17:15	75-34-3	
1,2-Dichloroethane	<7.6	ug/kg	69.5	7.6	1	04/04/19 12:06	04/04/19 17:15	107-06-2	
1,1-Dichloroethene	<20.8	ug/kg	69.5	20.8	1	04/04/19 12:06	04/04/19 17:15	75-35-4	
cis-1,2-Dichloroethene	<11.5	ug/kg	69.5	11.5	1	04/04/19 12:06	04/04/19 17:15	156-59-2	
trans-1,2-Dichloroethene	<32.5	ug/kg	69.5	32.5	1	04/04/19 12:06	04/04/19 17:15	156-60-5	
Dichlorofluoromethane	<96.0	ug/kg	695	96.0	1	04/04/19 12:06	04/04/19 17:15	75-43-4	N2
1,2-Dichloropropane	<12.0	ug/kg	69.5	12.0	1	04/04/19 12:06	04/04/19 17:15	78-87-5	
1,3-Dichloropropane	<9.6	ug/kg	69.5	9.6	1	04/04/19 12:06	04/04/19 17:15	142-28-9	
2,2-Dichloropropane	<8.7	ug/kg	278	8.7	1	04/04/19 12:06	04/04/19 17:15	594-20-7	
1,1-Dichloropropene	<32.1	ug/kg	69.5	32.1	1	04/04/19 12:06	04/04/19 17:15	563-58-6	
cis-1,3-Dichloropropene	<9.9	ug/kg	69.5	9.9	1	04/04/19 12:06	04/04/19 17:15	10061-01-5	
trans-1,3-Dichloropropene	<9.7	ug/kg	69.5	9.7	1	04/04/19 12:06	04/04/19 17:15	10061-02-6	
Diethyl ether (Ethyl ether)	<42.5	ug/kg	278	42.5	1	04/04/19 12:06	04/04/19 17:15	60-29-7	
Ethylbenzene	<3.8	ug/kg	69.5	3.8	1	04/04/19 12:06	04/04/19 17:15	100-41-4	
Hexachloro-1,3-butadiene	<17.0	ug/kg	347	17.0	1	04/04/19 12:06	04/04/19 17:15	87-68-3	
Isopropylbenzene (Cumene)	<3.1	ug/kg	69.5	3.1	1	04/04/19 12:06	04/04/19 17:15	98-82-8	
p-Isopropyltoluene	<21.1	ug/kg	69.5	21.1	1	04/04/19 12:06	04/04/19 17:15	99-87-6	
Methylene Chloride	<131	ug/kg	278	131	1	04/04/19 12:06	04/04/19 17:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	<14.4	ug/kg	347	14.4	1	04/04/19 12:06	04/04/19 17:15	108-10-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-08 (0-5ft)** Lab ID: **10469445008** Collected: 04/02/19 13:20 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Methyl-tert-butyl ether	<8.3	ug/kg	69.5	8.3	1	04/04/19 12:06	04/04/19 17:15	1634-04-4	
Naphthalene	<65.0	ug/kg	278	65.0	1	04/04/19 12:06	04/04/19 17:15	91-20-3	
n-Propylbenzene	<3.7	ug/kg	69.5	3.7	1	04/04/19 12:06	04/04/19 17:15	103-65-1	
Styrene	<3.2	ug/kg	69.5	3.2	1	04/04/19 12:06	04/04/19 17:15	100-42-5	
1,1,1,2-Tetrachloroethane	<21.8	ug/kg	69.5	21.8	1	04/04/19 12:06	04/04/19 17:15	630-20-6	
1,1,2,2-Tetrachloroethane	<12.2	ug/kg	69.5	12.2	1	04/04/19 12:06	04/04/19 17:15	79-34-5	
Tetrachloroethene	<24.5	ug/kg	69.5	24.5	1	04/04/19 12:06	04/04/19 17:15	127-18-4	
Tetrahydrofuran	<101	ug/kg	2780	101	1	04/04/19 12:06	04/04/19 17:15	109-99-9	
Toluene	<17.0	ug/kg	69.5	17.0	1	04/04/19 12:06	04/04/19 17:15	108-88-3	
1,2,3-Trichlorobenzene	<11.1	ug/kg	69.5	11.1	1	04/04/19 12:06	04/04/19 17:15	87-61-6	
1,2,4-Trichlorobenzene	<15.4	ug/kg	69.5	15.4	1	04/04/19 12:06	04/04/19 17:15	120-82-1	
1,1,1-Trichloroethane	<32.4	ug/kg	69.5	32.4	1	04/04/19 12:06	04/04/19 17:15	71-55-6	
1,1,2-Trichloroethane	<8.3	ug/kg	69.5	8.3	1	04/04/19 12:06	04/04/19 17:15	79-00-5	
Trichloroethene	<10.7	ug/kg	69.5	10.7	1	04/04/19 12:06	04/04/19 17:15	79-01-6	
Trichlorofluoromethane	<121	ug/kg	278	121	1	04/04/19 12:06	04/04/19 17:15	75-69-4	
1,2,3-Trichloropropane	<18.2	ug/kg	278	18.2	1	04/04/19 12:06	04/04/19 17:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	<80.6	ug/kg	278	80.6	1	04/04/19 12:06	04/04/19 17:15	76-13-1	
1,2,4-Trimethylbenzene	<13.9	ug/kg	69.5	13.9	1	04/04/19 12:06	04/04/19 17:15	95-63-6	
1,3,5-Trimethylbenzene	<11.1	ug/kg	69.5	11.1	1	04/04/19 12:06	04/04/19 17:15	108-67-8	
Vinyl chloride	<13.7	ug/kg	27.8	13.7	1	04/04/19 12:06	04/04/19 17:15	75-01-4	
Xylene (Total)	<16.1	ug/kg	208	16.1	1	04/04/19 12:06	04/04/19 17:15	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	109	%	75-125		1	04/04/19 12:06	04/04/19 17:15	17060-07-0	
Toluene-d8 (S)	106	%	75-125		1	04/04/19 12:06	04/04/19 17:15	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/04/19 12:06	04/04/19 17:15	460-00-4	

Sample: **FL-SB-09 (0-8ft)** Lab ID: **10469445009** Collected: 04/02/19 14:30 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	53.1	mg/kg	15.5	4.0	2	04/04/19 17:58	04/05/19 17:38		T6
Surrogates									
n-Triacontane (S)	130	%	50-150		2	04/04/19 17:58	04/05/19 17:38	638-68-6	
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	<1.5	mg/kg	11.3	1.5	1	04/12/19 15:21	04/13/19 01:59		
Surrogates									
a,a,a-Trifluorotoluene (S)	97	%	80-150		1	04/12/19 15:21	04/13/19 01:59	98-08-8	
6010D MET ICP		Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Barium	61.2	mg/kg	0.52	0.043	1	04/05/19 11:58	04/09/19 13:51	7440-39-3	
Silver	<0.038	mg/kg	0.52	0.038	1	04/05/19 11:58	04/09/19 13:51	7440-22-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-09 (0-8ft) **Lab ID: 10469445009** Collected: 04/02/19 14:30 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	3.6	mg/kg	0.57	0.20	20	04/05/19 11:58	04/16/19 00:22	7440-38-2	
Cadmium	0.19	mg/kg	0.091	0.030	20	04/05/19 11:58	04/16/19 00:22	7440-43-9	
Chromium	12.4	mg/kg	0.57	0.14	20	04/05/19 11:58	04/16/19 00:22	7440-47-3	
Lead	19.2	mg/kg	0.23	0.065	20	04/05/19 11:58	04/16/19 00:22	7439-92-1	
Selenium	0.92	mg/kg	0.57	0.17	20	04/05/19 11:58	04/16/19 00:22	7782-49-2	
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.031	mg/kg	0.021	0.0084	1	04/05/19 12:48	04/15/19 13:31	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	12.6	%	0.10	0.10	1		04/05/19 13:33		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	96.0	ug/kg	56.9	2.3	5	04/04/19 09:08	04/05/19 20:48	83-32-9	
Acenaphthylene	188	ug/kg	56.9	2.8	5	04/04/19 09:08	04/05/19 20:48	208-96-8	
Anthracene	361	ug/kg	56.9	2.7	5	04/04/19 09:08	04/05/19 20:48	120-12-7	
Benzo(a)anthracene	807	ug/kg	56.9	6.1	5	04/04/19 09:08	04/05/19 20:48	56-55-3	
Benzo(a)pyrene	797	ug/kg	56.9	3.9	5	04/04/19 09:08	04/05/19 20:48	50-32-8	
Benzo(b)fluoranthene	829	ug/kg	56.9	2.1	5	04/04/19 09:08	04/05/19 20:48	205-99-2	
Benzo(e)pyrene	485	ug/kg	56.9	4.1	5	04/04/19 09:08	04/05/19 20:48	192-97-2	N2
Benzo(g,h,i)perylene	499	ug/kg	56.9	3.6	5	04/04/19 09:08	04/05/19 20:48	191-24-2	
Benzo(k)fluoranthene	437	ug/kg	56.9	4.8	5	04/04/19 09:08	04/05/19 20:48	207-08-9	
Chrysene	718	ug/kg	56.9	7.7	5	04/04/19 09:08	04/05/19 20:48	218-01-9	
Dibenz(a,h)anthracene	182	ug/kg	56.9	2.6	5	04/04/19 09:08	04/05/19 20:48	53-70-3	
Fluoranthene	1640	ug/kg	56.9	2.4	5	04/04/19 09:08	04/05/19 20:48	206-44-0	
Fluorene	165	ug/kg	56.9	1.8	5	04/04/19 09:08	04/05/19 20:48	86-73-7	
Indeno(1,2,3-cd)pyrene	427	ug/kg	56.9	3.8	5	04/04/19 09:08	04/05/19 20:48	193-39-5	
Naphthalene	<4.4	ug/kg	56.9	4.4	5	04/04/19 09:08	04/05/19 20:48	91-20-3	
Phenanthrene	673	ug/kg	56.9	10.9	5	04/04/19 09:08	04/05/19 20:48	85-01-8	
Pyrene	1100	ug/kg	56.9	8.7	5	04/04/19 09:08	04/05/19 20:48	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	83	%	30-125		5	04/04/19 09:08	04/05/19 20:48	321-60-8	
p-Terphenyl-d14 (S)	77	%	30-125		5	04/04/19 09:08	04/05/19 20:48	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<369	ug/kg	1180	369	1	04/04/19 12:06	04/04/19 17:33	67-64-1	
Allyl chloride	<49.6	ug/kg	237	49.6	1	04/04/19 12:06	04/04/19 17:33	107-05-1	
Benzene	<3.3	ug/kg	23.7	3.3	1	04/04/19 12:06	04/04/19 17:33	71-43-2	
Bromobenzene	<3.6	ug/kg	59.2	3.6	1	04/04/19 12:06	04/04/19 17:33	108-86-1	
Bromochloromethane	<20.5	ug/kg	59.2	20.5	1	04/04/19 12:06	04/04/19 17:33	74-97-5	
Bromodichloromethane	<20.3	ug/kg	59.2	20.3	1	04/04/19 12:06	04/04/19 17:33	75-27-4	
Bromoform	<89.7	ug/kg	237	89.7	1	04/04/19 12:06	04/04/19 17:33	75-25-2	
Bromomethane	<69.3	ug/kg	592	69.3	1	04/04/19 12:06	04/04/19 17:33	74-83-9	
2-Butanone (MEK)	<31.5	ug/kg	296	31.5	1	04/04/19 12:06	04/04/19 17:33	78-93-3	
n-Butylbenzene	<28.2	ug/kg	59.2	28.2	1	04/04/19 12:06	04/04/19 17:33	104-51-8	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-09 (0-8ft)** Lab ID: **10469445009** Collected: 04/02/19 14:30 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
sec-Butylbenzene	<11.4	ug/kg	59.2	11.4	1	04/04/19 12:06	04/04/19 17:33	135-98-8	
tert-Butylbenzene	<11.4	ug/kg	59.2	11.4	1	04/04/19 12:06	04/04/19 17:33	98-06-6	
Carbon tetrachloride	<28.3	ug/kg	237	28.3	1	04/04/19 12:06	04/04/19 17:33	56-23-5	
Chlorobenzene	<3.3	ug/kg	59.2	3.3	1	04/04/19 12:06	04/04/19 17:33	108-90-7	
Chloroethane	<30.8	ug/kg	592	30.8	1	04/04/19 12:06	04/04/19 17:33	75-00-3	
Chloroform	<29.6	ug/kg	59.2	29.6	1	04/04/19 12:06	04/04/19 17:33	67-66-3	
Chloromethane	<14.2	ug/kg	237	14.2	1	04/04/19 12:06	04/04/19 17:33	74-87-3	
2-Chlorotoluene	<2.9	ug/kg	59.2	2.9	1	04/04/19 12:06	04/04/19 17:33	95-49-8	
4-Chlorotoluene	<3.0	ug/kg	59.2	3.0	1	04/04/19 12:06	04/04/19 17:33	106-43-4	
1,2-Dibromo-3-chloropropane	<206	ug/kg	592	206	1	04/04/19 12:06	04/04/19 17:33	96-12-8	
Dibromochloromethane	<6.9	ug/kg	237	6.9	1	04/04/19 12:06	04/04/19 17:33	124-48-1	
1,2-Dibromoethane (EDB)	<6.2	ug/kg	59.2	6.2	1	04/04/19 12:06	04/04/19 17:33	106-93-4	
Dibromomethane	<10.9	ug/kg	59.2	10.9	1	04/04/19 12:06	04/04/19 17:33	74-95-3	
1,2-Dichlorobenzene	<2.4	ug/kg	59.2	2.4	1	04/04/19 12:06	04/04/19 17:33	95-50-1	
1,3-Dichlorobenzene	<2.2	ug/kg	59.2	2.2	1	04/04/19 12:06	04/04/19 17:33	541-73-1	
1,4-Dichlorobenzene	<3.7	ug/kg	59.2	3.7	1	04/04/19 12:06	04/04/19 17:33	106-46-7	
Dichlorodifluoromethane	<19.2	ug/kg	237	19.2	1	04/04/19 12:06	04/04/19 17:33	75-71-8	
1,1-Dichloroethane	<6.6	ug/kg	59.2	6.6	1	04/04/19 12:06	04/04/19 17:33	75-34-3	
1,2-Dichloroethane	<6.5	ug/kg	59.2	6.5	1	04/04/19 12:06	04/04/19 17:33	107-06-2	
1,1-Dichloroethene	<17.8	ug/kg	59.2	17.8	1	04/04/19 12:06	04/04/19 17:33	75-35-4	
cis-1,2-Dichloroethene	<9.8	ug/kg	59.2	9.8	1	04/04/19 12:06	04/04/19 17:33	156-59-2	
trans-1,2-Dichloroethene	<27.7	ug/kg	59.2	27.7	1	04/04/19 12:06	04/04/19 17:33	156-60-5	
Dichlorofluoromethane	<81.9	ug/kg	592	81.9	1	04/04/19 12:06	04/04/19 17:33	75-43-4	N2
1,2-Dichloropropane	<10.2	ug/kg	59.2	10.2	1	04/04/19 12:06	04/04/19 17:33	78-87-5	
1,3-Dichloropropane	<8.2	ug/kg	59.2	8.2	1	04/04/19 12:06	04/04/19 17:33	142-28-9	
2,2-Dichloropropane	<7.4	ug/kg	237	7.4	1	04/04/19 12:06	04/04/19 17:33	594-20-7	
1,1-Dichloropropene	<27.4	ug/kg	59.2	27.4	1	04/04/19 12:06	04/04/19 17:33	563-58-6	
cis-1,3-Dichloropropene	<8.5	ug/kg	59.2	8.5	1	04/04/19 12:06	04/04/19 17:33	10061-01-5	
trans-1,3-Dichloropropene	<8.2	ug/kg	59.2	8.2	1	04/04/19 12:06	04/04/19 17:33	10061-02-6	
Diethyl ether (Ethyl ether)	<36.3	ug/kg	237	36.3	1	04/04/19 12:06	04/04/19 17:33	60-29-7	
Ethylbenzene	<3.2	ug/kg	59.2	3.2	1	04/04/19 12:06	04/04/19 17:33	100-41-4	
Hexachloro-1,3-butadiene	<14.5	ug/kg	296	14.5	1	04/04/19 12:06	04/04/19 17:33	87-68-3	
Isopropylbenzene (Cumene)	<2.6	ug/kg	59.2	2.6	1	04/04/19 12:06	04/04/19 17:33	98-82-8	
p-Isopropyltoluene	<18.0	ug/kg	59.2	18.0	1	04/04/19 12:06	04/04/19 17:33	99-87-6	
Methylene Chloride	<112	ug/kg	237	112	1	04/04/19 12:06	04/04/19 17:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	<12.3	ug/kg	296	12.3	1	04/04/19 12:06	04/04/19 17:33	108-10-1	
Methyl-tert-butyl ether	<7.1	ug/kg	59.2	7.1	1	04/04/19 12:06	04/04/19 17:33	1634-04-4	
Naphthalene	62.1J	ug/kg	237	55.5	1	04/04/19 12:06	04/04/19 17:33	91-20-3	
n-Propylbenzene	<3.2	ug/kg	59.2	3.2	1	04/04/19 12:06	04/04/19 17:33	103-65-1	
Styrene	<2.7	ug/kg	59.2	2.7	1	04/04/19 12:06	04/04/19 17:33	100-42-5	
1,1,1,2-Tetrachloroethane	<18.6	ug/kg	59.2	18.6	1	04/04/19 12:06	04/04/19 17:33	630-20-6	
1,1,2,2-Tetrachloroethane	<10.4	ug/kg	59.2	10.4	1	04/04/19 12:06	04/04/19 17:33	79-34-5	
Tetrachloroethene	<20.9	ug/kg	59.2	20.9	1	04/04/19 12:06	04/04/19 17:33	127-18-4	
Tetrahydrofuran	<86.1	ug/kg	2370	86.1	1	04/04/19 12:06	04/04/19 17:33	109-99-9	
Toluene	<14.5	ug/kg	59.2	14.5	1	04/04/19 12:06	04/04/19 17:33	108-88-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-09 (0-8ft) **Lab ID: 10469445009** Collected: 04/02/19 14:30 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,2,3-Trichlorobenzene	<9.5	ug/kg	59.2	9.5	1	04/04/19 12:06	04/04/19 17:33	87-61-6	
1,2,4-Trichlorobenzene	<13.2	ug/kg	59.2	13.2	1	04/04/19 12:06	04/04/19 17:33	120-82-1	
1,1,1-Trichloroethane	<27.6	ug/kg	59.2	27.6	1	04/04/19 12:06	04/04/19 17:33	71-55-6	
1,1,2-Trichloroethane	<7.1	ug/kg	59.2	7.1	1	04/04/19 12:06	04/04/19 17:33	79-00-5	
Trichloroethene	<9.1	ug/kg	59.2	9.1	1	04/04/19 12:06	04/04/19 17:33	79-01-6	
Trichlorofluoromethane	<103	ug/kg	237	103	1	04/04/19 12:06	04/04/19 17:33	75-69-4	
1,2,3-Trichloropropane	<15.5	ug/kg	237	15.5	1	04/04/19 12:06	04/04/19 17:33	96-18-4	
1,1,2-Trichlorotrifluoroethane	<68.7	ug/kg	237	68.7	1	04/04/19 12:06	04/04/19 17:33	76-13-1	
1,2,4-Trimethylbenzene	<11.8	ug/kg	59.2	11.8	1	04/04/19 12:06	04/04/19 17:33	95-63-6	
1,3,5-Trimethylbenzene	<9.4	ug/kg	59.2	9.4	1	04/04/19 12:06	04/04/19 17:33	108-67-8	
Vinyl chloride	<11.7	ug/kg	23.7	11.7	1	04/04/19 12:06	04/04/19 17:33	75-01-4	
Xylene (Total)	<13.7	ug/kg	178	13.7	1	04/04/19 12:06	04/04/19 17:33	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	107	%	75-125		1	04/04/19 12:06	04/04/19 17:33	17060-07-0	
Toluene-d8 (S)	107	%	75-125		1	04/04/19 12:06	04/04/19 17:33	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1	04/04/19 12:06	04/04/19 17:33	460-00-4	

Sample: FL-SB-10 (0-25ft) **Lab ID: 10469445010** Collected: 04/02/19 15:15 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	56.4	mg/kg	8.9	2.3	1	04/04/19 17:58	04/06/19 12:22		T6
Surrogates									
n-Triacontane (S)	124	%	50-150		1	04/04/19 17:58	04/06/19 12:22	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.5	mg/kg	11.9	1.5	1	04/12/19 15:21	04/12/19 21:06		
Surrogates									
a,a,a-Trifluorotoluene (S)	96	%	80-150		1	04/12/19 15:21	04/12/19 21:06	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	50.1	mg/kg	0.56	0.047	1	04/05/19 11:58	04/09/19 13:54	7440-39-3	
Silver	<0.041	mg/kg	0.56	0.041	1	04/05/19 11:58	04/09/19 13:54	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	4.1	mg/kg	0.55	0.19	20	04/05/19 11:58	04/16/19 00:26	7440-38-2	
Cadmium	0.11	mg/kg	0.087	0.029	20	04/05/19 11:58	04/16/19 00:26	7440-43-9	
Chromium	14.0	mg/kg	0.55	0.14	20	04/05/19 11:58	04/16/19 00:26	7440-47-3	
Lead	13.9	mg/kg	0.22	0.063	20	04/05/19 11:58	04/16/19 00:26	7439-92-1	
Selenium	0.89	mg/kg	0.55	0.16	20	04/05/19 11:58	04/16/19 00:26	7782-49-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-10 (0-25ft) **Lab ID: 10469445010** Collected: 04/02/19 15:15 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.013J	mg/kg	0.020	0.0080	1	04/05/19 12:48	04/15/19 13:33	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	10.9	%	0.10	0.10	1		04/05/19 13:33		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	83.3	ug/kg	56.1	2.3	5	04/04/19 09:08	04/05/19 21:09	83-32-9	
Acenaphthylene	277	ug/kg	56.1	2.8	5	04/04/19 09:08	04/05/19 21:09	208-96-8	
Anthracene	655	ug/kg	56.1	2.6	5	04/04/19 09:08	04/05/19 21:09	120-12-7	
Benzo(a)anthracene	1040	ug/kg	56.1	6.1	5	04/04/19 09:08	04/05/19 21:09	56-55-3	
Benzo(a)pyrene	842	ug/kg	56.1	3.9	5	04/04/19 09:08	04/05/19 21:09	50-32-8	
Benzo(b)fluoranthene	965	ug/kg	56.1	2.1	5	04/04/19 09:08	04/05/19 21:09	205-99-2	
Benzo(e)pyrene	526	ug/kg	56.1	4.0	5	04/04/19 09:08	04/05/19 21:09	192-97-2	N2
Benzo(g,h,i)perylene	503	ug/kg	56.1	3.6	5	04/04/19 09:08	04/05/19 21:09	191-24-2	
Benzo(k)fluoranthene	570	ug/kg	56.1	4.7	5	04/04/19 09:08	04/05/19 21:09	207-08-9	
Chrysene	893	ug/kg	56.1	7.6	5	04/04/19 09:08	04/05/19 21:09	218-01-9	
Dibenz(a,h)anthracene	180	ug/kg	56.1	2.6	5	04/04/19 09:08	04/05/19 21:09	53-70-3	
Fluoranthene	2920	ug/kg	280	12.0	25	04/04/19 09:08	04/08/19 14:07	206-44-0	
Fluorene	415	ug/kg	56.1	1.8	5	04/04/19 09:08	04/05/19 21:09	86-73-7	
Indeno(1,2,3-cd)pyrene	472	ug/kg	56.1	3.8	5	04/04/19 09:08	04/05/19 21:09	193-39-5	
Naphthalene	107	ug/kg	56.1	4.3	5	04/04/19 09:08	04/05/19 21:09	91-20-3	
Phenanthrene	2170	ug/kg	280	53.8	25	04/04/19 09:08	04/08/19 14:07	85-01-8	
Pyrene	1680	ug/kg	56.1	8.6	5	04/04/19 09:08	04/05/19 21:09	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	94	%	30-125		5	04/04/19 09:08	04/05/19 21:09	321-60-8	
p-Terphenyl-d14 (S)	84	%	30-125		5	04/04/19 09:08	04/05/19 21:09	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<335	ug/kg	1080	335	1	04/04/19 12:06	04/04/19 17:52	67-64-1	
Allyl chloride	<45.2	ug/kg	216	45.2	1	04/04/19 12:06	04/04/19 17:52	107-05-1	
Benzene	<3.0	ug/kg	21.6	3.0	1	04/04/19 12:06	04/04/19 17:52	71-43-2	
Bromobenzene	<3.3	ug/kg	53.9	3.3	1	04/04/19 12:06	04/04/19 17:52	108-86-1	
Bromochloromethane	<18.7	ug/kg	53.9	18.7	1	04/04/19 12:06	04/04/19 17:52	74-97-5	
Bromodichloromethane	<18.4	ug/kg	53.9	18.4	1	04/04/19 12:06	04/04/19 17:52	75-27-4	
Bromoform	<81.6	ug/kg	216	81.6	1	04/04/19 12:06	04/04/19 17:52	75-25-2	
Bromomethane	<63.1	ug/kg	539	63.1	1	04/04/19 12:06	04/04/19 17:52	74-83-9	
2-Butanone (MEK)	<28.7	ug/kg	270	28.7	1	04/04/19 12:06	04/04/19 17:52	78-93-3	
n-Butylbenzene	<25.7	ug/kg	53.9	25.7	1	04/04/19 12:06	04/04/19 17:52	104-51-8	
sec-Butylbenzene	<10.3	ug/kg	53.9	10.3	1	04/04/19 12:06	04/04/19 17:52	135-98-8	
tert-Butylbenzene	<10.4	ug/kg	53.9	10.4	1	04/04/19 12:06	04/04/19 17:52	98-06-6	
Carbon tetrachloride	<25.8	ug/kg	216	25.8	1	04/04/19 12:06	04/04/19 17:52	56-23-5	
Chlorobenzene	<3.0	ug/kg	53.9	3.0	1	04/04/19 12:06	04/04/19 17:52	108-90-7	
Chloroethane	<28.0	ug/kg	539	28.0	1	04/04/19 12:06	04/04/19 17:52	75-00-3	
Chloroform	<27.0	ug/kg	53.9	27.0	1	04/04/19 12:06	04/04/19 17:52	67-66-3	
Chloromethane	<12.9	ug/kg	216	12.9	1	04/04/19 12:06	04/04/19 17:52	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-10 (0-25ft)** Lab ID: **10469445010** Collected: 04/02/19 15:15 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
2-Chlorotoluene	<2.7	ug/kg	53.9	2.7	1	04/04/19 12:06	04/04/19 17:52	95-49-8	
4-Chlorotoluene	<2.8	ug/kg	53.9	2.8	1	04/04/19 12:06	04/04/19 17:52	106-43-4	
1,2-Dibromo-3-chloropropane	<188	ug/kg	539	188	1	04/04/19 12:06	04/04/19 17:52	96-12-8	
Dibromochloromethane	<6.3	ug/kg	216	6.3	1	04/04/19 12:06	04/04/19 17:52	124-48-1	
1,2-Dibromoethane (EDB)	<5.7	ug/kg	53.9	5.7	1	04/04/19 12:06	04/04/19 17:52	106-93-4	
Dibromomethane	<9.9	ug/kg	53.9	9.9	1	04/04/19 12:06	04/04/19 17:52	74-95-3	
1,2-Dichlorobenzene	<2.2	ug/kg	53.9	2.2	1	04/04/19 12:06	04/04/19 17:52	95-50-1	
1,3-Dichlorobenzene	<2.0	ug/kg	53.9	2.0	1	04/04/19 12:06	04/04/19 17:52	541-73-1	
1,4-Dichlorobenzene	<3.3	ug/kg	53.9	3.3	1	04/04/19 12:06	04/04/19 17:52	106-46-7	
Dichlorodifluoromethane	<17.5	ug/kg	216	17.5	1	04/04/19 12:06	04/04/19 17:52	75-71-8	
1,1-Dichloroethane	<6.1	ug/kg	53.9	6.1	1	04/04/19 12:06	04/04/19 17:52	75-34-3	
1,2-Dichloroethane	<5.9	ug/kg	53.9	5.9	1	04/04/19 12:06	04/04/19 17:52	107-06-2	
1,1-Dichloroethene	<16.2	ug/kg	53.9	16.2	1	04/04/19 12:06	04/04/19 17:52	75-35-4	
cis-1,2-Dichloroethene	<8.9	ug/kg	53.9	8.9	1	04/04/19 12:06	04/04/19 17:52	156-59-2	
trans-1,2-Dichloroethene	<25.2	ug/kg	53.9	25.2	1	04/04/19 12:06	04/04/19 17:52	156-60-5	
Dichlorofluoromethane	<74.5	ug/kg	539	74.5	1	04/04/19 12:06	04/04/19 17:52	75-43-4	N2
1,2-Dichloropropane	<9.3	ug/kg	53.9	9.3	1	04/04/19 12:06	04/04/19 17:52	78-87-5	
1,3-Dichloropropane	<7.5	ug/kg	53.9	7.5	1	04/04/19 12:06	04/04/19 17:52	142-28-9	
2,2-Dichloropropane	<6.7	ug/kg	216	6.7	1	04/04/19 12:06	04/04/19 17:52	594-20-7	
1,1-Dichloropropene	<24.9	ug/kg	53.9	24.9	1	04/04/19 12:06	04/04/19 17:52	563-58-6	
cis-1,3-Dichloropropene	<7.7	ug/kg	53.9	7.7	1	04/04/19 12:06	04/04/19 17:52	10061-01-5	
trans-1,3-Dichloropropene	<7.5	ug/kg	53.9	7.5	1	04/04/19 12:06	04/04/19 17:52	10061-02-6	
Diethyl ether (Ethyl ether)	<33.0	ug/kg	216	33.0	1	04/04/19 12:06	04/04/19 17:52	60-29-7	
Ethylbenzene	<2.9	ug/kg	53.9	2.9	1	04/04/19 12:06	04/04/19 17:52	100-41-4	
Hexachloro-1,3-butadiene	<13.2	ug/kg	270	13.2	1	04/04/19 12:06	04/04/19 17:52	87-68-3	
Isopropylbenzene (Cumene)	<2.4	ug/kg	53.9	2.4	1	04/04/19 12:06	04/04/19 17:52	98-82-8	
p-Isopropyltoluene	<16.4	ug/kg	53.9	16.4	1	04/04/19 12:06	04/04/19 17:52	99-87-6	
Methylene Chloride	<101	ug/kg	216	101	1	04/04/19 12:06	04/04/19 17:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	<11.2	ug/kg	270	11.2	1	04/04/19 12:06	04/04/19 17:52	108-10-1	
Methyl-tert-butyl ether	<6.4	ug/kg	53.9	6.4	1	04/04/19 12:06	04/04/19 17:52	1634-04-4	
Naphthalene	115J	ug/kg	216	50.5	1	04/04/19 12:06	04/04/19 17:52	91-20-3	
n-Propylbenzene	<2.9	ug/kg	53.9	2.9	1	04/04/19 12:06	04/04/19 17:52	103-65-1	
Styrene	<2.5	ug/kg	53.9	2.5	1	04/04/19 12:06	04/04/19 17:52	100-42-5	
1,1,1,2-Tetrachloroethane	<16.9	ug/kg	53.9	16.9	1	04/04/19 12:06	04/04/19 17:52	630-20-6	
1,1,1,2,2-Tetrachloroethane	<9.5	ug/kg	53.9	9.5	1	04/04/19 12:06	04/04/19 17:52	79-34-5	
Tetrachloroethene	<19.0	ug/kg	53.9	19.0	1	04/04/19 12:06	04/04/19 17:52	127-18-4	
Tetrahydrofuran	<78.4	ug/kg	2160	78.4	1	04/04/19 12:06	04/04/19 17:52	109-99-9	
Toluene	<13.2	ug/kg	53.9	13.2	1	04/04/19 12:06	04/04/19 17:52	108-88-3	
1,2,3-Trichlorobenzene	<8.6	ug/kg	53.9	8.6	1	04/04/19 12:06	04/04/19 17:52	87-61-6	
1,2,4-Trichlorobenzene	<12.0	ug/kg	53.9	12.0	1	04/04/19 12:06	04/04/19 17:52	120-82-1	
1,1,1-Trichloroethane	<25.1	ug/kg	53.9	25.1	1	04/04/19 12:06	04/04/19 17:52	71-55-6	
1,1,2-Trichloroethane	<6.4	ug/kg	53.9	6.4	1	04/04/19 12:06	04/04/19 17:52	79-00-5	
Trichloroethene	<8.3	ug/kg	53.9	8.3	1	04/04/19 12:06	04/04/19 17:52	79-01-6	
Trichlorofluoromethane	<94.0	ug/kg	216	94.0	1	04/04/19 12:06	04/04/19 17:52	75-69-4	
1,2,3-Trichloropropane	<14.1	ug/kg	216	14.1	1	04/04/19 12:06	04/04/19 17:52	96-18-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-10 (0-25ft) **Lab ID: 10469445010** Collected: 04/02/19 15:15 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,2-Trichlorotrifluoroethane	<62.6	ug/kg	216	62.6	1	04/04/19 12:06	04/04/19 17:52	76-13-1	
1,2,4-Trimethylbenzene	<10.8	ug/kg	53.9	10.8	1	04/04/19 12:06	04/04/19 17:52	95-63-6	
1,3,5-Trimethylbenzene	<8.6	ug/kg	53.9	8.6	1	04/04/19 12:06	04/04/19 17:52	108-67-8	
Vinyl chloride	<10.6	ug/kg	21.6	10.6	1	04/04/19 12:06	04/04/19 17:52	75-01-4	
Xylene (Total)	<12.5	ug/kg	162	12.5	1	04/04/19 12:06	04/04/19 17:52	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	110	%	75-125		1	04/04/19 12:06	04/04/19 17:52	17060-07-0	
Toluene-d8 (S)	106	%	75-125		1	04/04/19 12:06	04/04/19 17:52	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1	04/04/19 12:06	04/04/19 17:52	460-00-4	
Total Organic Carbon									
Analytical Method: EPA 9060 Modified									
Surrogates									
RPD%	7.0	%	0.10	0.10	1		04/16/19 09:11		
Total Organic Carbon	8980	mg/kg	6380	1910	1		04/16/19 09:11	7440-44-0	
Total Organic Carbon	9630	mg/kg	6610	1980	1		04/16/19 09:17	7440-44-0	
Mean Total Organic Carbon	9300	mg/kg	6490	1950	1		04/16/19 09:11	7440-44-0	

Sample: FL-SB-11 (0-20ft) **Lab ID: 10469445011** Collected: 04/02/19 16:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	28.9	mg/kg	10.0	2.6	1	04/04/19 17:58	04/05/19 17:45		T6
Surrogates									
n-Triacontane (S)	99	%	50-150		1	04/04/19 17:58	04/05/19 17:45	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.6	mg/kg	12.5	1.6	1	04/12/19 15:21	04/13/19 02:22		
Surrogates									
a,a,a-Trifluorotoluene (S)	94	%	80-150		1	04/12/19 15:21	04/13/19 02:22	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	47.8	mg/kg	0.58	0.048	1	04/05/19 11:58	04/09/19 13:57	7440-39-3	
Silver	<0.042	mg/kg	0.58	0.042	1	04/05/19 11:58	04/09/19 13:57	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	3.9	mg/kg	0.53	0.19	20	04/05/19 11:58	04/16/19 00:31	7440-38-2	
Cadmium	0.14	mg/kg	0.084	0.028	20	04/05/19 11:58	04/16/19 00:31	7440-43-9	
Chromium	15.2	mg/kg	0.53	0.13	20	04/05/19 11:58	04/16/19 00:31	7440-47-3	
Lead	16.0	mg/kg	0.21	0.061	20	04/05/19 11:58	04/16/19 00:31	7439-92-1	
Selenium	0.98	mg/kg	0.53	0.15	20	04/05/19 11:58	04/16/19 00:31	7782-49-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-11 (0-20ft) **Lab ID: 10469445011** Collected: 04/02/19 16:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.017J	mg/kg	0.022	0.0088	1	04/05/19 12:48	04/15/19 13:35	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	13.9	%	0.10	0.10	1		04/05/19 13:33		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	359	ug/kg	57.6	2.4	5	04/04/19 09:08	04/05/19 21:30	83-32-9	
Acenaphthylene	<2.8	ug/kg	57.6	2.8	5	04/04/19 09:08	04/05/19 21:30	208-96-8	
Anthracene	334	ug/kg	57.6	2.7	5	04/04/19 09:08	04/05/19 21:30	120-12-7	
Benzo(a)anthracene	108	ug/kg	57.6	6.2	5	04/04/19 09:08	04/05/19 21:30	56-55-3	
Benzo(a)pyrene	78.6	ug/kg	57.6	4.0	5	04/04/19 09:08	04/05/19 21:30	50-32-8	
Benzo(b)fluoranthene	89.5	ug/kg	57.6	2.1	5	04/04/19 09:08	04/05/19 21:30	205-99-2	
Benzo(e)pyrene	55.2J	ug/kg	57.6	4.1	5	04/04/19 09:08	04/05/19 21:30	192-97-2	N2
Benzo(g,h,i)perylene	55.0J	ug/kg	57.6	3.6	5	04/04/19 09:08	04/05/19 21:30	191-24-2	
Benzo(k)fluoranthene	50.7J	ug/kg	57.6	4.9	5	04/04/19 09:08	04/05/19 21:30	207-08-9	
Chrysene	118	ug/kg	57.6	7.8	5	04/04/19 09:08	04/05/19 21:30	218-01-9	
Dibenz(a,h)anthracene	<2.7	ug/kg	57.6	2.7	5	04/04/19 09:08	04/05/19 21:30	53-70-3	
Fluoranthene	523	ug/kg	57.6	2.5	5	04/04/19 09:08	04/05/19 21:30	206-44-0	
Fluorene	278	ug/kg	57.6	1.8	5	04/04/19 09:08	04/05/19 21:30	86-73-7	
Indeno(1,2,3-cd)pyrene	<3.9	ug/kg	57.6	3.9	5	04/04/19 09:08	04/05/19 21:30	193-39-5	
Naphthalene	170	ug/kg	57.6	4.4	5	04/04/19 09:08	04/05/19 21:30	91-20-3	
Phenanthrene	876	ug/kg	57.6	11.1	5	04/04/19 09:08	04/05/19 21:30	85-01-8	
Pyrene	340	ug/kg	57.6	8.8	5	04/04/19 09:08	04/05/19 21:30	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	90	%	30-125		5	04/04/19 09:08	04/05/19 21:30	321-60-8	
p-Terphenyl-d14 (S)	83	%	30-125		5	04/04/19 09:08	04/05/19 21:30	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<392	ug/kg	1260	392	1	04/04/19 12:06	04/04/19 18:09	67-64-1	
Allyl chloride	<52.8	ug/kg	252	52.8	1	04/04/19 12:06	04/04/19 18:09	107-05-1	
Benzene	<3.6	ug/kg	25.2	3.6	1	04/04/19 12:06	04/04/19 18:09	71-43-2	
Bromobenzene	<3.9	ug/kg	63.0	3.9	1	04/04/19 12:06	04/04/19 18:09	108-86-1	
Bromochloromethane	<21.8	ug/kg	63.0	21.8	1	04/04/19 12:06	04/04/19 18:09	74-97-5	
Bromodichloromethane	<21.5	ug/kg	63.0	21.5	1	04/04/19 12:06	04/04/19 18:09	75-27-4	
Bromoform	<95.4	ug/kg	252	95.4	1	04/04/19 12:06	04/04/19 18:09	75-25-2	
Bromomethane	<73.7	ug/kg	630	73.7	1	04/04/19 12:06	04/04/19 18:09	74-83-9	
2-Butanone (MEK)	<33.5	ug/kg	315	33.5	1	04/04/19 12:06	04/04/19 18:09	78-93-3	
n-Butylbenzene	<30.0	ug/kg	63.0	30.0	1	04/04/19 12:06	04/04/19 18:09	104-51-8	
sec-Butylbenzene	<12.1	ug/kg	63.0	12.1	1	04/04/19 12:06	04/04/19 18:09	135-98-8	
tert-Butylbenzene	<12.1	ug/kg	63.0	12.1	1	04/04/19 12:06	04/04/19 18:09	98-06-6	
Carbon tetrachloride	<30.1	ug/kg	252	30.1	1	04/04/19 12:06	04/04/19 18:09	56-23-5	
Chlorobenzene	<3.6	ug/kg	63.0	3.6	1	04/04/19 12:06	04/04/19 18:09	108-90-7	
Chloroethane	<32.8	ug/kg	630	32.8	1	04/04/19 12:06	04/04/19 18:09	75-00-3	
Chloroform	<31.5	ug/kg	63.0	31.5	1	04/04/19 12:06	04/04/19 18:09	67-66-3	
Chloromethane	<15.1	ug/kg	252	15.1	1	04/04/19 12:06	04/04/19 18:09	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-11 (0-20ft)** Lab ID: **10469445011** Collected: 04/02/19 16:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
2-Chlorotoluene	<3.1	ug/kg	63.0	3.1	1	04/04/19 12:06	04/04/19 18:09	95-49-8	
4-Chlorotoluene	<3.2	ug/kg	63.0	3.2	1	04/04/19 12:06	04/04/19 18:09	106-43-4	
1,2-Dibromo-3-chloropropane	<219	ug/kg	630	219	1	04/04/19 12:06	04/04/19 18:09	96-12-8	
Dibromochloromethane	<7.3	ug/kg	252	7.3	1	04/04/19 12:06	04/04/19 18:09	124-48-1	
1,2-Dibromoethane (EDB)	<6.6	ug/kg	63.0	6.6	1	04/04/19 12:06	04/04/19 18:09	106-93-4	
Dibromomethane	<11.6	ug/kg	63.0	11.6	1	04/04/19 12:06	04/04/19 18:09	74-95-3	
1,2-Dichlorobenzene	<2.5	ug/kg	63.0	2.5	1	04/04/19 12:06	04/04/19 18:09	95-50-1	
1,3-Dichlorobenzene	<2.3	ug/kg	63.0	2.3	1	04/04/19 12:06	04/04/19 18:09	541-73-1	
1,4-Dichlorobenzene	<3.9	ug/kg	63.0	3.9	1	04/04/19 12:06	04/04/19 18:09	106-46-7	
Dichlorodifluoromethane	<20.4	ug/kg	252	20.4	1	04/04/19 12:06	04/04/19 18:09	75-71-8	
1,1-Dichloroethane	<7.1	ug/kg	63.0	7.1	1	04/04/19 12:06	04/04/19 18:09	75-34-3	
1,2-Dichloroethane	<6.9	ug/kg	63.0	6.9	1	04/04/19 12:06	04/04/19 18:09	107-06-2	
1,1-Dichloroethene	<18.9	ug/kg	63.0	18.9	1	04/04/19 12:06	04/04/19 18:09	75-35-4	
cis-1,2-Dichloroethene	<10.4	ug/kg	63.0	10.4	1	04/04/19 12:06	04/04/19 18:09	156-59-2	
trans-1,2-Dichloroethene	<29.5	ug/kg	63.0	29.5	1	04/04/19 12:06	04/04/19 18:09	156-60-5	
Dichlorofluoromethane	<87.1	ug/kg	630	87.1	1	04/04/19 12:06	04/04/19 18:09	75-43-4	N2
1,2-Dichloropropane	<10.9	ug/kg	63.0	10.9	1	04/04/19 12:06	04/04/19 18:09	78-87-5	
1,3-Dichloropropane	<8.7	ug/kg	63.0	8.7	1	04/04/19 12:06	04/04/19 18:09	142-28-9	
2,2-Dichloropropane	<7.9	ug/kg	252	7.9	1	04/04/19 12:06	04/04/19 18:09	594-20-7	
1,1-Dichloropropene	<29.1	ug/kg	63.0	29.1	1	04/04/19 12:06	04/04/19 18:09	563-58-6	
cis-1,3-Dichloropropene	<9.0	ug/kg	63.0	9.0	1	04/04/19 12:06	04/04/19 18:09	10061-01-5	
trans-1,3-Dichloropropene	<8.8	ug/kg	63.0	8.8	1	04/04/19 12:06	04/04/19 18:09	10061-02-6	
Diethyl ether (Ethyl ether)	<38.6	ug/kg	252	38.6	1	04/04/19 12:06	04/04/19 18:09	60-29-7	
Ethylbenzene	<3.4	ug/kg	63.0	3.4	1	04/04/19 12:06	04/04/19 18:09	100-41-4	
Hexachloro-1,3-butadiene	<15.4	ug/kg	315	15.4	1	04/04/19 12:06	04/04/19 18:09	87-68-3	
Isopropylbenzene (Cumene)	<2.8	ug/kg	63.0	2.8	1	04/04/19 12:06	04/04/19 18:09	98-82-8	
p-Isopropyltoluene	<19.2	ug/kg	63.0	19.2	1	04/04/19 12:06	04/04/19 18:09	99-87-6	
Methylene Chloride	<119	ug/kg	252	119	1	04/04/19 12:06	04/04/19 18:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	<13.1	ug/kg	315	13.1	1	04/04/19 12:06	04/04/19 18:09	108-10-1	
Methyl-tert-butyl ether	<7.5	ug/kg	63.0	7.5	1	04/04/19 12:06	04/04/19 18:09	1634-04-4	
Naphthalene	1320	ug/kg	252	59.0	1	04/04/19 12:06	04/04/19 18:09	91-20-3	
n-Propylbenzene	<3.4	ug/kg	63.0	3.4	1	04/04/19 12:06	04/04/19 18:09	103-65-1	
Styrene	<2.9	ug/kg	63.0	2.9	1	04/04/19 12:06	04/04/19 18:09	100-42-5	
1,1,1,2-Tetrachloroethane	<19.8	ug/kg	63.0	19.8	1	04/04/19 12:06	04/04/19 18:09	630-20-6	
1,1,2,2-Tetrachloroethane	<11.1	ug/kg	63.0	11.1	1	04/04/19 12:06	04/04/19 18:09	79-34-5	
Tetrachloroethene	<22.2	ug/kg	63.0	22.2	1	04/04/19 12:06	04/04/19 18:09	127-18-4	
Tetrahydrofuran	<91.6	ug/kg	2520	91.6	1	04/04/19 12:06	04/04/19 18:09	109-99-9	
Toluene	<15.4	ug/kg	63.0	15.4	1	04/04/19 12:06	04/04/19 18:09	108-88-3	
1,2,3-Trichlorobenzene	<10.1	ug/kg	63.0	10.1	1	04/04/19 12:06	04/04/19 18:09	87-61-6	
1,2,4-Trichlorobenzene	<14.0	ug/kg	63.0	14.0	1	04/04/19 12:06	04/04/19 18:09	120-82-1	
1,1,1-Trichloroethane	<29.4	ug/kg	63.0	29.4	1	04/04/19 12:06	04/04/19 18:09	71-55-6	
1,1,2-Trichloroethane	<7.5	ug/kg	63.0	7.5	1	04/04/19 12:06	04/04/19 18:09	79-00-5	
Trichloroethene	<9.7	ug/kg	63.0	9.7	1	04/04/19 12:06	04/04/19 18:09	79-01-6	
Trichlorofluoromethane	<110	ug/kg	252	110	1	04/04/19 12:06	04/04/19 18:09	75-69-4	
1,2,3-Trichloropropane	<16.5	ug/kg	252	16.5	1	04/04/19 12:06	04/04/19 18:09	96-18-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-11 (0-20ft) **Lab ID: 10469445011** Collected: 04/02/19 16:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,2-Trichlorotrifluoroethane	<73.1	ug/kg	252	73.1	1	04/04/19 12:06	04/04/19 18:09	76-13-1	
1,2,4-Trimethylbenzene	<12.6	ug/kg	63.0	12.6	1	04/04/19 12:06	04/04/19 18:09	95-63-6	
1,3,5-Trimethylbenzene	<10.0	ug/kg	63.0	10.0	1	04/04/19 12:06	04/04/19 18:09	108-67-8	
Vinyl chloride	<12.4	ug/kg	25.2	12.4	1	04/04/19 12:06	04/04/19 18:09	75-01-4	
Xylene (Total)	<14.6	ug/kg	189	14.6	1	04/04/19 12:06	04/04/19 18:09	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	108	%	75-125		1	04/04/19 12:06	04/04/19 18:09	17060-07-0	
Toluene-d8 (S)	108	%	75-125		1	04/04/19 12:06	04/04/19 18:09	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1	04/04/19 12:06	04/04/19 18:09	460-00-4	
Total Organic Carbon									
Analytical Method: EPA 9060 Modified									
Surrogates									
RPD%	11.5	%	0.10	0.10	1		04/16/19 10:04		
Total Organic Carbon	14700	mg/kg	10900	3280	1		04/16/19 10:04	7440-44-0	
Total Organic Carbon	16500	mg/kg	10600	3180	1		04/16/19 10:09	7440-44-0	
Mean Total Organic Carbon	15600	mg/kg	10800	3230	1		04/16/19 10:04	7440-44-0	

Sample: FL-SB-12 (0-10ft) **Lab ID: 10469445012** Collected: 04/02/19 16:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	10.9	mg/kg	9.2	2.4	1	04/04/19 17:58	04/05/19 17:51		T6
Surrogates									
n-Triacontane (S)	87	%	50-150		1	04/04/19 17:58	04/05/19 17:51	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.5	mg/kg	11.3	1.5	1	04/12/19 15:21	04/13/19 02:46		
Surrogates									
a,a,a-Trifluorotoluene (S)	95	%	80-150		1	04/12/19 15:21	04/13/19 02:46	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	110	mg/kg	0.55	0.046	1	04/05/19 11:58	04/09/19 13:59	7440-39-3	
Silver	<0.040	mg/kg	0.55	0.040	1	04/05/19 11:58	04/09/19 13:59	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	4.8	mg/kg	0.56	0.20	20	04/05/19 11:58	04/16/19 00:35	7440-38-2	
Cadmium	0.40	mg/kg	0.090	0.030	20	04/05/19 11:58	04/16/19 00:35	7440-43-9	
Chromium	16.4	mg/kg	0.56	0.14	20	04/05/19 11:58	04/16/19 00:35	7440-47-3	
Lead	12.1	mg/kg	0.23	0.065	20	04/05/19 11:58	04/16/19 00:35	7439-92-1	
Selenium	1.7	mg/kg	0.56	0.16	20	04/05/19 11:58	04/16/19 00:35	7782-49-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-12 (0-10ft) **Lab ID: 10469445012** Collected: 04/02/19 16:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.015J	mg/kg	0.021	0.0086	1	04/05/19 12:48	04/15/19 13:38	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	15.4	%	0.10	0.10	1		04/05/19 13:33		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<0.48	ug/kg	11.8	0.48	1	04/04/19 09:08	04/08/19 14:28	83-32-9	
Acenaphthylene	<0.58	ug/kg	11.8	0.58	1	04/04/19 09:08	04/08/19 14:28	208-96-8	
Anthracene	31.7	ug/kg	11.8	0.55	1	04/04/19 09:08	04/08/19 14:28	120-12-7	
Benzo(a)anthracene	53.3	ug/kg	11.8	1.3	1	04/04/19 09:08	04/08/19 14:28	56-55-3	
Benzo(a)pyrene	58.6	ug/kg	11.8	0.81	1	04/04/19 09:08	04/08/19 14:28	50-32-8	
Benzo(b)fluoranthene	66.0	ug/kg	11.8	0.44	1	04/04/19 09:08	04/08/19 14:28	205-99-2	
Benzo(e)pyrene	41.6	ug/kg	11.8	0.85	1	04/04/19 09:08	04/08/19 14:28	192-97-2	N2
Benzo(g,h,i)perylene	52.6	ug/kg	11.8	0.75	1	04/04/19 09:08	04/08/19 14:28	191-24-2	
Benzo(k)fluoranthene	39.3	ug/kg	11.8	1.0	1	04/04/19 09:08	04/08/19 14:28	207-08-9	
Chrysene	59.9	ug/kg	11.8	1.6	1	04/04/19 09:08	04/08/19 14:28	218-01-9	
Dibenz(a,h)anthracene	<0.54	ug/kg	11.8	0.54	1	04/04/19 09:08	04/08/19 14:28	53-70-3	
Fluoranthene	153	ug/kg	11.8	0.51	1	04/04/19 09:08	04/08/19 14:28	206-44-0	
Fluorene	14.0	ug/kg	11.8	0.37	1	04/04/19 09:08	04/08/19 14:28	86-73-7	
Indeno(1,2,3-cd)pyrene	33.9	ug/kg	11.8	0.79	1	04/04/19 09:08	04/08/19 14:28	193-39-5	
Naphthalene	<0.91	ug/kg	11.8	0.91	1	04/04/19 09:08	04/08/19 14:28	91-20-3	
Phenanthrene	106	ug/kg	11.8	2.3	1	04/04/19 09:08	04/08/19 14:28	85-01-8	
Pyrene	110	ug/kg	11.8	1.8	1	04/04/19 09:08	04/08/19 14:28	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	84	%	30-125		1	04/04/19 09:08	04/08/19 14:28	321-60-8	
p-Terphenyl-d14 (S)	74	%	30-125		1	04/04/19 09:08	04/08/19 14:28	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<352	ug/kg	1130	352	1	04/04/19 12:06	04/04/19 18:28	67-64-1	
Allyl chloride	<47.4	ug/kg	226	47.4	1	04/04/19 12:06	04/04/19 18:28	107-05-1	
Benzene	<3.2	ug/kg	22.6	3.2	1	04/04/19 12:06	04/04/19 18:28	71-43-2	
Bromobenzene	<3.5	ug/kg	56.6	3.5	1	04/04/19 12:06	04/04/19 18:28	108-86-1	
Bromochloromethane	<19.6	ug/kg	56.6	19.6	1	04/04/19 12:06	04/04/19 18:28	74-97-5	
Bromodichloromethane	<19.3	ug/kg	56.6	19.3	1	04/04/19 12:06	04/04/19 18:28	75-27-4	
Bromoform	<85.6	ug/kg	226	85.6	1	04/04/19 12:06	04/04/19 18:28	75-25-2	
Bromomethane	<66.2	ug/kg	566	66.2	1	04/04/19 12:06	04/04/19 18:28	74-83-9	
2-Butanone (MEK)	<30.1	ug/kg	283	30.1	1	04/04/19 12:06	04/04/19 18:28	78-93-3	
n-Butylbenzene	<26.9	ug/kg	56.6	26.9	1	04/04/19 12:06	04/04/19 18:28	104-51-8	
sec-Butylbenzene	<10.8	ug/kg	56.6	10.8	1	04/04/19 12:06	04/04/19 18:28	135-98-8	
tert-Butylbenzene	<10.9	ug/kg	56.6	10.9	1	04/04/19 12:06	04/04/19 18:28	98-06-6	
Carbon tetrachloride	<27.0	ug/kg	226	27.0	1	04/04/19 12:06	04/04/19 18:28	56-23-5	
Chlorobenzene	<3.2	ug/kg	56.6	3.2	1	04/04/19 12:06	04/04/19 18:28	108-90-7	
Chloroethane	<29.4	ug/kg	566	29.4	1	04/04/19 12:06	04/04/19 18:28	75-00-3	
Chloroform	<28.3	ug/kg	56.6	28.3	1	04/04/19 12:06	04/04/19 18:28	67-66-3	
Chloromethane	<13.6	ug/kg	226	13.6	1	04/04/19 12:06	04/04/19 18:28	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-12 (0-10ft) **Lab ID: 10469445012** Collected: 04/02/19 16:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
2-Chlorotoluene	<2.8	ug/kg	56.6	2.8	1	04/04/19 12:06	04/04/19 18:28	95-49-8	
4-Chlorotoluene	<2.9	ug/kg	56.6	2.9	1	04/04/19 12:06	04/04/19 18:28	106-43-4	
1,2-Dibromo-3-chloropropane	<197	ug/kg	566	197	1	04/04/19 12:06	04/04/19 18:28	96-12-8	
Dibromochloromethane	<6.6	ug/kg	226	6.6	1	04/04/19 12:06	04/04/19 18:28	124-48-1	
1,2-Dibromoethane (EDB)	<5.9	ug/kg	56.6	5.9	1	04/04/19 12:06	04/04/19 18:28	106-93-4	
Dibromomethane	<10.4	ug/kg	56.6	10.4	1	04/04/19 12:06	04/04/19 18:28	74-95-3	
1,2-Dichlorobenzene	<2.3	ug/kg	56.6	2.3	1	04/04/19 12:06	04/04/19 18:28	95-50-1	
1,3-Dichlorobenzene	<2.1	ug/kg	56.6	2.1	1	04/04/19 12:06	04/04/19 18:28	541-73-1	
1,4-Dichlorobenzene	<3.5	ug/kg	56.6	3.5	1	04/04/19 12:06	04/04/19 18:28	106-46-7	
Dichlorodifluoromethane	<18.3	ug/kg	226	18.3	1	04/04/19 12:06	04/04/19 18:28	75-71-8	
1,1-Dichloroethane	<6.3	ug/kg	56.6	6.3	1	04/04/19 12:06	04/04/19 18:28	75-34-3	
1,2-Dichloroethane	<6.2	ug/kg	56.6	6.2	1	04/04/19 12:06	04/04/19 18:28	107-06-2	
1,1-Dichloroethene	<17.0	ug/kg	56.6	17.0	1	04/04/19 12:06	04/04/19 18:28	75-35-4	
cis-1,2-Dichloroethene	<9.4	ug/kg	56.6	9.4	1	04/04/19 12:06	04/04/19 18:28	156-59-2	
trans-1,2-Dichloroethene	<26.5	ug/kg	56.6	26.5	1	04/04/19 12:06	04/04/19 18:28	156-60-5	
Dichlorofluoromethane	<78.2	ug/kg	566	78.2	1	04/04/19 12:06	04/04/19 18:28	75-43-4	N2
1,2-Dichloropropane	<9.7	ug/kg	56.6	9.7	1	04/04/19 12:06	04/04/19 18:28	78-87-5	
1,3-Dichloropropane	<7.8	ug/kg	56.6	7.8	1	04/04/19 12:06	04/04/19 18:28	142-28-9	
2,2-Dichloropropane	<7.1	ug/kg	226	7.1	1	04/04/19 12:06	04/04/19 18:28	594-20-7	
1,1-Dichloropropene	<26.1	ug/kg	56.6	26.1	1	04/04/19 12:06	04/04/19 18:28	563-58-6	
cis-1,3-Dichloropropene	<8.1	ug/kg	56.6	8.1	1	04/04/19 12:06	04/04/19 18:28	10061-01-5	
trans-1,3-Dichloropropene	<7.9	ug/kg	56.6	7.9	1	04/04/19 12:06	04/04/19 18:28	10061-02-6	
Diethyl ether (Ethyl ether)	<34.6	ug/kg	226	34.6	1	04/04/19 12:06	04/04/19 18:28	60-29-7	
Ethylbenzene	<3.1	ug/kg	56.6	3.1	1	04/04/19 12:06	04/04/19 18:28	100-41-4	
Hexachloro-1,3-butadiene	<13.8	ug/kg	283	13.8	1	04/04/19 12:06	04/04/19 18:28	87-68-3	
Isopropylbenzene (Cumene)	<2.5	ug/kg	56.6	2.5	1	04/04/19 12:06	04/04/19 18:28	98-82-8	
p-Isopropyltoluene	<17.2	ug/kg	56.6	17.2	1	04/04/19 12:06	04/04/19 18:28	99-87-6	
Methylene Chloride	<106	ug/kg	226	106	1	04/04/19 12:06	04/04/19 18:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	<11.8	ug/kg	283	11.8	1	04/04/19 12:06	04/04/19 18:28	108-10-1	
Methyl-tert-butyl ether	<6.7	ug/kg	56.6	6.7	1	04/04/19 12:06	04/04/19 18:28	1634-04-4	
Naphthalene	<52.9	ug/kg	226	52.9	1	04/04/19 12:06	04/04/19 18:28	91-20-3	
n-Propylbenzene	<3.0	ug/kg	56.6	3.0	1	04/04/19 12:06	04/04/19 18:28	103-65-1	
Styrene	<2.6	ug/kg	56.6	2.6	1	04/04/19 12:06	04/04/19 18:28	100-42-5	
1,1,1,2-Tetrachloroethane	<17.8	ug/kg	56.6	17.8	1	04/04/19 12:06	04/04/19 18:28	630-20-6	
1,1,1,2,2-Tetrachloroethane	<10	ug/kg	56.6	10	1	04/04/19 12:06	04/04/19 18:28	79-34-5	
Tetrachloroethene	<19.9	ug/kg	56.6	19.9	1	04/04/19 12:06	04/04/19 18:28	127-18-4	
Tetrahydrofuran	<82.2	ug/kg	2260	82.2	1	04/04/19 12:06	04/04/19 18:28	109-99-9	
Toluene	<13.8	ug/kg	56.6	13.8	1	04/04/19 12:06	04/04/19 18:28	108-88-3	
1,2,3-Trichlorobenzene	<9.0	ug/kg	56.6	9.0	1	04/04/19 12:06	04/04/19 18:28	87-61-6	
1,2,4-Trichlorobenzene	<12.6	ug/kg	56.6	12.6	1	04/04/19 12:06	04/04/19 18:28	120-82-1	
1,1,1-Trichloroethane	<26.4	ug/kg	56.6	26.4	1	04/04/19 12:06	04/04/19 18:28	71-55-6	
1,1,2-Trichloroethane	<6.8	ug/kg	56.6	6.8	1	04/04/19 12:06	04/04/19 18:28	79-00-5	
Trichloroethene	<8.7	ug/kg	56.6	8.7	1	04/04/19 12:06	04/04/19 18:28	79-01-6	
Trichlorofluoromethane	<98.6	ug/kg	226	98.6	1	04/04/19 12:06	04/04/19 18:28	75-69-4	
1,2,3-Trichloropropane	<14.8	ug/kg	226	14.8	1	04/04/19 12:06	04/04/19 18:28	96-18-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-12 (0-10ft) **Lab ID: 10469445012** Collected: 04/02/19 16:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,1,2-Trichlorotrifluoroethane	<65.6	ug/kg	226	65.6	1	04/04/19 12:06	04/04/19 18:28	76-13-1	
1,2,4-Trimethylbenzene	<11.3	ug/kg	56.6	11.3	1	04/04/19 12:06	04/04/19 18:28	95-63-6	
1,3,5-Trimethylbenzene	<9.0	ug/kg	56.6	9.0	1	04/04/19 12:06	04/04/19 18:28	108-67-8	
Vinyl chloride	<11.1	ug/kg	22.6	11.1	1	04/04/19 12:06	04/04/19 18:28	75-01-4	
Xylene (Total)	<13.1	ug/kg	170	13.1	1	04/04/19 12:06	04/04/19 18:28	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	111	%	75-125		1	04/04/19 12:06	04/04/19 18:28	17060-07-0	
Toluene-d8 (S)	106	%	75-125		1	04/04/19 12:06	04/04/19 18:28	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1	04/04/19 12:06	04/04/19 18:28	460-00-4	
Total Organic Carbon		Analytical Method: EPA 9060 Modified							
Surrogates									
RPD%	13.7	%	0.10	0.10	1		04/16/19 10:38		
Total Organic Carbon	14100	mg/kg	7500	2250	1		04/16/19 10:38	7440-44-0	
Total Organic Carbon	12300	mg/kg	7700	2310	1		04/16/19 10:44	7440-44-0	
Mean Total Organic Carbon	13200	mg/kg	7600	2280	1		04/16/19 10:38	7440-44-0	

Sample: FL-SB-13 (0-6ft) **Lab ID: 10469445013** Collected: 04/02/19 17:10 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS		Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	458	mg/kg	441	115	10	04/04/19 17:58	04/06/19 12:03		T6
Surrogates									
n-Triacontane (S)	0	%	50-150		10	04/04/19 17:58	04/06/19 12:03	638-68-6	P3,S4
WIGRO GCV		Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	<1.5	mg/kg	12.1	1.5	1	04/12/19 15:21	04/13/19 03:11		
Surrogates									
a,a,a-Trifluorotoluene (S)	100	%	80-150		1	04/12/19 15:21	04/13/19 03:11	98-08-8	
6010D MET ICP		Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Barium	48.7	mg/kg	0.55	0.046	1	04/05/19 11:58	04/09/19 14:02	7440-39-3	
Silver	<0.040	mg/kg	0.55	0.040	1	04/05/19 11:58	04/09/19 14:02	7440-22-4	
6020B MET ICPMS		Analytical Method: EPA 6020B Preparation Method: EPA 3050							
Arsenic	3.1	mg/kg	0.54	0.19	20	04/05/19 11:58	04/16/19 00:40	7440-38-2	
Cadmium	0.19	mg/kg	0.087	0.029	20	04/05/19 11:58	04/16/19 00:40	7440-43-9	
Chromium	10.7	mg/kg	0.54	0.13	20	04/05/19 11:58	04/16/19 00:40	7440-47-3	
Lead	34.7	mg/kg	0.22	0.062	20	04/05/19 11:58	04/16/19 00:40	7439-92-1	
Selenium	0.72	mg/kg	0.54	0.16	20	04/05/19 11:58	04/16/19 00:40	7782-49-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-13 (0-6ft) **Lab ID: 10469445013** Collected: 04/02/19 17:10 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.018J	mg/kg	0.019	0.0078	1	04/05/19 12:48	04/15/19 13:40	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	9.5	%	0.10	0.10	1		04/09/19 14:20		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<4.5	ug/kg	110	4.5	1	04/04/19 09:08	04/08/19 14:50	83-32-9	
Acenaphthylene	<5.4	ug/kg	110	5.4	1	04/04/19 09:08	04/08/19 14:50	208-96-8	
Anthracene	209	ug/kg	110	5.1	1	04/04/19 09:08	04/08/19 14:50	120-12-7	
Benzo(a)anthracene	485	ug/kg	110	11.9	1	04/04/19 09:08	04/08/19 14:50	56-55-3	
Benzo(a)pyrene	479	ug/kg	110	7.5	1	04/04/19 09:08	04/08/19 14:50	50-32-8	
Benzo(b)fluoranthene	481	ug/kg	110	4.1	1	04/04/19 09:08	04/08/19 14:50	205-99-2	
Benzo(e)pyrene	335	ug/kg	110	7.9	1	04/04/19 09:08	04/08/19 14:50	192-97-2	N2
Benzo(g,h,i)perylene	375	ug/kg	110	7.0	1	04/04/19 09:08	04/08/19 14:50	191-24-2	
Benzo(k)fluoranthene	296	ug/kg	110	9.3	1	04/04/19 09:08	04/08/19 14:50	207-08-9	
Chrysene	507	ug/kg	110	14.9	1	04/04/19 09:08	04/08/19 14:50	218-01-9	
Dibenz(a,h)anthracene	<5.1	ug/kg	110	5.1	1	04/04/19 09:08	04/08/19 14:50	53-70-3	
Fluoranthene	1030	ug/kg	110	4.7	1	04/04/19 09:08	04/08/19 14:50	206-44-0	
Fluorene	118	ug/kg	110	3.4	1	04/04/19 09:08	04/08/19 14:50	86-73-7	
Indeno(1,2,3-cd)pyrene	234	ug/kg	110	7.4	1	04/04/19 09:08	04/08/19 14:50	193-39-5	
Naphthalene	<8.5	ug/kg	110	8.5	1	04/04/19 09:08	04/08/19 14:50	91-20-3	
Phenanthrene	762	ug/kg	110	21.1	1	04/04/19 09:08	04/08/19 14:50	85-01-8	
Pyrene	864	ug/kg	110	16.8	1	04/04/19 09:08	04/08/19 14:50	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	0	%	30-125		1	04/04/19 09:08	04/08/19 14:50	321-60-8	P3,S0
p-Terphenyl-d14 (S)	0	%	30-125		1	04/04/19 09:08	04/08/19 14:50	1718-51-0	S0
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<370	ug/kg	1190	370	1	04/04/19 12:06	04/04/19 18:45	67-64-1	
Allyl chloride	<49.8	ug/kg	238	49.8	1	04/04/19 12:06	04/04/19 18:45	107-05-1	
Benzene	32.9	ug/kg	23.8	3.4	1	04/04/19 12:06	04/04/19 18:45	71-43-2	
Bromobenzene	<3.6	ug/kg	59.4	3.6	1	04/04/19 12:06	04/04/19 18:45	108-86-1	
Bromochloromethane	<20.6	ug/kg	59.4	20.6	1	04/04/19 12:06	04/04/19 18:45	74-97-5	
Bromodichloromethane	<20.3	ug/kg	59.4	20.3	1	04/04/19 12:06	04/04/19 18:45	75-27-4	
Bromoform	<90.0	ug/kg	238	90.0	1	04/04/19 12:06	04/04/19 18:45	75-25-2	
Bromomethane	<69.5	ug/kg	594	69.5	1	04/04/19 12:06	04/04/19 18:45	74-83-9	
2-Butanone (MEK)	<31.6	ug/kg	297	31.6	1	04/04/19 12:06	04/04/19 18:45	78-93-3	
n-Butylbenzene	<28.3	ug/kg	59.4	28.3	1	04/04/19 12:06	04/04/19 18:45	104-51-8	
sec-Butylbenzene	<11.4	ug/kg	59.4	11.4	1	04/04/19 12:06	04/04/19 18:45	135-98-8	
tert-Butylbenzene	<11.4	ug/kg	59.4	11.4	1	04/04/19 12:06	04/04/19 18:45	98-06-6	
Carbon tetrachloride	<28.4	ug/kg	238	28.4	1	04/04/19 12:06	04/04/19 18:45	56-23-5	
Chlorobenzene	<3.4	ug/kg	59.4	3.4	1	04/04/19 12:06	04/04/19 18:45	108-90-7	
Chloroethane	<30.9	ug/kg	594	30.9	1	04/04/19 12:06	04/04/19 18:45	75-00-3	
Chloroform	<29.7	ug/kg	59.4	29.7	1	04/04/19 12:06	04/04/19 18:45	67-66-3	
Chloromethane	<14.3	ug/kg	238	14.3	1	04/04/19 12:06	04/04/19 18:45	74-87-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-13 (0-6ft)** Lab ID: **10469445013** Collected: 04/02/19 17:10 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
2-Chlorotoluene	<2.9	ug/kg	59.4	2.9	1	04/04/19 12:06	04/04/19 18:45	95-49-8	
4-Chlorotoluene	<3.0	ug/kg	59.4	3.0	1	04/04/19 12:06	04/04/19 18:45	106-43-4	
1,2-Dibromo-3-chloropropane	<207	ug/kg	594	207	1	04/04/19 12:06	04/04/19 18:45	96-12-8	
Dibromochloromethane	<6.9	ug/kg	238	6.9	1	04/04/19 12:06	04/04/19 18:45	124-48-1	
1,2-Dibromoethane (EDB)	<6.3	ug/kg	59.4	6.3	1	04/04/19 12:06	04/04/19 18:45	106-93-4	
Dibromomethane	<10.9	ug/kg	59.4	10.9	1	04/04/19 12:06	04/04/19 18:45	74-95-3	
1,2-Dichlorobenzene	<2.4	ug/kg	59.4	2.4	1	04/04/19 12:06	04/04/19 18:45	95-50-1	
1,3-Dichlorobenzene	<2.2	ug/kg	59.4	2.2	1	04/04/19 12:06	04/04/19 18:45	541-73-1	
1,4-Dichlorobenzene	<3.7	ug/kg	59.4	3.7	1	04/04/19 12:06	04/04/19 18:45	106-46-7	
Dichlorodifluoromethane	<19.3	ug/kg	238	19.3	1	04/04/19 12:06	04/04/19 18:45	75-71-8	
1,1-Dichloroethane	<6.7	ug/kg	59.4	6.7	1	04/04/19 12:06	04/04/19 18:45	75-34-3	
1,2-Dichloroethane	<6.5	ug/kg	59.4	6.5	1	04/04/19 12:06	04/04/19 18:45	107-06-2	
1,1-Dichloroethene	<17.8	ug/kg	59.4	17.8	1	04/04/19 12:06	04/04/19 18:45	75-35-4	
cis-1,2-Dichloroethene	<9.9	ug/kg	59.4	9.9	1	04/04/19 12:06	04/04/19 18:45	156-59-2	
trans-1,2-Dichloroethene	<27.8	ug/kg	59.4	27.8	1	04/04/19 12:06	04/04/19 18:45	156-60-5	
Dichlorofluoromethane	<82.1	ug/kg	594	82.1	1	04/04/19 12:06	04/04/19 18:45	75-43-4	N2
1,2-Dichloropropane	<10.2	ug/kg	59.4	10.2	1	04/04/19 12:06	04/04/19 18:45	78-87-5	
1,3-Dichloropropane	<8.2	ug/kg	59.4	8.2	1	04/04/19 12:06	04/04/19 18:45	142-28-9	
2,2-Dichloropropane	<7.4	ug/kg	238	7.4	1	04/04/19 12:06	04/04/19 18:45	594-20-7	
1,1-Dichloropropene	<27.5	ug/kg	59.4	27.5	1	04/04/19 12:06	04/04/19 18:45	563-58-6	
cis-1,3-Dichloropropene	<8.5	ug/kg	59.4	8.5	1	04/04/19 12:06	04/04/19 18:45	10061-01-5	
trans-1,3-Dichloropropene	<8.3	ug/kg	59.4	8.3	1	04/04/19 12:06	04/04/19 18:45	10061-02-6	
Diethyl ether (Ethyl ether)	<36.4	ug/kg	238	36.4	1	04/04/19 12:06	04/04/19 18:45	60-29-7	
Ethylbenzene	7.2J	ug/kg	59.4	3.2	1	04/04/19 12:06	04/04/19 18:45	100-41-4	
Hexachloro-1,3-butadiene	<14.5	ug/kg	297	14.5	1	04/04/19 12:06	04/04/19 18:45	87-68-3	
Isopropylbenzene (Cumene)	23.3J	ug/kg	59.4	2.6	1	04/04/19 12:06	04/04/19 18:45	98-82-8	
p-Isopropyltoluene	<18.1	ug/kg	59.4	18.1	1	04/04/19 12:06	04/04/19 18:45	99-87-6	
Methylene Chloride	<112	ug/kg	238	112	1	04/04/19 12:06	04/04/19 18:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	<12.4	ug/kg	297	12.4	1	04/04/19 12:06	04/04/19 18:45	108-10-1	
Methyl-tert-butyl ether	<7.1	ug/kg	59.4	7.1	1	04/04/19 12:06	04/04/19 18:45	1634-04-4	
Naphthalene	133J	ug/kg	238	55.6	1	04/04/19 12:06	04/04/19 18:45	91-20-3	
n-Propylbenzene	14.4J	ug/kg	59.4	3.2	1	04/04/19 12:06	04/04/19 18:45	103-65-1	
Styrene	<2.7	ug/kg	59.4	2.7	1	04/04/19 12:06	04/04/19 18:45	100-42-5	
1,1,1,2-Tetrachloroethane	<18.7	ug/kg	59.4	18.7	1	04/04/19 12:06	04/04/19 18:45	630-20-6	
1,1,1,2,2-Tetrachloroethane	<10.5	ug/kg	59.4	10.5	1	04/04/19 12:06	04/04/19 18:45	79-34-5	
Tetrachloroethene	<20.9	ug/kg	59.4	20.9	1	04/04/19 12:06	04/04/19 18:45	127-18-4	
Tetrahydrofuran	<86.4	ug/kg	2380	86.4	1	04/04/19 12:06	04/04/19 18:45	109-99-9	
Toluene	<14.5	ug/kg	59.4	14.5	1	04/04/19 12:06	04/04/19 18:45	108-88-3	
1,2,3-Trichlorobenzene	<9.5	ug/kg	59.4	9.5	1	04/04/19 12:06	04/04/19 18:45	87-61-6	
1,2,4-Trichlorobenzene	<13.2	ug/kg	59.4	13.2	1	04/04/19 12:06	04/04/19 18:45	120-82-1	
1,1,1-Trichloroethane	<27.7	ug/kg	59.4	27.7	1	04/04/19 12:06	04/04/19 18:45	71-55-6	
1,1,2-Trichloroethane	<7.1	ug/kg	59.4	7.1	1	04/04/19 12:06	04/04/19 18:45	79-00-5	
Trichloroethene	<9.2	ug/kg	59.4	9.2	1	04/04/19 12:06	04/04/19 18:45	79-01-6	
Trichlorofluoromethane	<104	ug/kg	238	104	1	04/04/19 12:06	04/04/19 18:45	75-69-4	
1,2,3-Trichloropropane	<15.6	ug/kg	238	15.6	1	04/04/19 12:06	04/04/19 18:45	96-18-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-13 (0-6ft) **Lab ID: 10469445013** Collected: 04/02/19 17:10 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,2-Trichlorotrifluoroethane	<68.9	ug/kg	238	68.9	1	04/04/19 12:06	04/04/19 18:45	76-13-1	
1,2,4-Trimethylbenzene	15.8J	ug/kg	59.4	11.9	1	04/04/19 12:06	04/04/19 18:45	95-63-6	
1,3,5-Trimethylbenzene	<9.5	ug/kg	59.4	9.5	1	04/04/19 12:06	04/04/19 18:45	108-67-8	
Vinyl chloride	<11.7	ug/kg	23.8	11.7	1	04/04/19 12:06	04/04/19 18:45	75-01-4	
Xylene (Total)	128J	ug/kg	178	13.8	1	04/04/19 12:06	04/04/19 18:45	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	111	%	75-125		1	04/04/19 12:06	04/04/19 18:45	17060-07-0	
Toluene-d8 (S)	105	%	75-125		1	04/04/19 12:06	04/04/19 18:45	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1	04/04/19 12:06	04/04/19 18:45	460-00-4	
Total Organic Carbon									
Analytical Method: EPA 9060 Modified									
Surrogates									
RPD%	12.5	%	0.10	0.10	1		04/16/19 10:49		
Total Organic Carbon	22000	mg/kg	6420	1930	1		04/16/19 10:49	7440-44-0	
Total Organic Carbon	19400	mg/kg	6310	1890	1		04/16/19 10:55	7440-44-0	
Mean Total Organic Carbon	20700	mg/kg	6370	1910	1		04/16/19 10:49	7440-44-0	

Sample: FL-SB-14 (0-10ft) **Lab ID: 10469445014** Collected: 04/02/19 17:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS									
Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO									
WDRO C10-C28	19.6	mg/kg	10.6	2.8	1	04/04/19 17:58	04/05/19 17:58		T6
Surrogates									
n-Triacontane (S)	87	%	50-150		1	04/04/19 17:58	04/05/19 17:58	638-68-6	
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.8	mg/kg	14.1	1.8	1	04/12/19 15:21	04/13/19 03:35		
Surrogates									
a,a,a-Trifluorotoluene (S)	96	%	80-150		1	04/12/19 15:21	04/13/19 03:35	98-08-8	
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3050									
Barium	78.0	mg/kg	0.62	0.051	1	04/05/19 11:58	04/09/19 14:05	7440-39-3	
Silver	<0.045	mg/kg	0.62	0.045	1	04/05/19 11:58	04/09/19 14:05	7440-22-4	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3050									
Arsenic	4.2	mg/kg	0.58	0.20	20	04/05/19 11:58	04/16/19 00:44	7440-38-2	
Cadmium	0.27	mg/kg	0.092	0.031	20	04/05/19 11:58	04/16/19 00:44	7440-43-9	
Chromium	17.0	mg/kg	0.58	0.14	20	04/05/19 11:58	04/16/19 00:44	7440-47-3	
Lead	19.9	mg/kg	0.23	0.066	20	04/05/19 11:58	04/16/19 00:44	7439-92-1	
Selenium	1.4	mg/kg	0.58	0.17	20	04/05/19 11:58	04/16/19 00:44	7782-49-2	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-14 (0-10ft) **Lab ID: 10469445014** Collected: 04/02/19 17:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.047	mg/kg	0.022	0.0089	1	04/05/19 12:48	04/15/19 13:42	7439-97-6	
Dry Weight / %M by ASTM D2974									
Analytical Method: ASTM D2974									
Percent Moisture	20.5	%	0.10	0.10	1		04/09/19 14:21		
8270D MSSV PAH by SIM									
Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550									
Acenaphthene	<2.6	ug/kg	62.8	2.6	5	04/04/19 09:08	04/05/19 22:34	83-32-9	
Acenaphthylene	<3.1	ug/kg	62.8	3.1	5	04/04/19 09:08	04/05/19 22:34	208-96-8	
Anthracene	<2.9	ug/kg	62.8	2.9	5	04/04/19 09:08	04/05/19 22:34	120-12-7	
Benzo(a)anthracene	163	ug/kg	62.8	6.8	5	04/04/19 09:08	04/05/19 22:34	56-55-3	
Benzo(a)pyrene	201	ug/kg	62.8	4.3	5	04/04/19 09:08	04/05/19 22:34	50-32-8	
Benzo(b)fluoranthene	236	ug/kg	62.8	2.3	5	04/04/19 09:08	04/05/19 22:34	205-99-2	
Benzo(e)pyrene	129	ug/kg	62.8	4.5	5	04/04/19 09:08	04/05/19 22:34	192-97-2	N2
Benzo(g,h,i)perylene	157	ug/kg	62.8	4.0	5	04/04/19 09:08	04/05/19 22:34	191-24-2	
Benzo(k)fluoranthene	115	ug/kg	62.8	5.3	5	04/04/19 09:08	04/05/19 22:34	207-08-9	
Chrysene	173	ug/kg	62.8	8.5	5	04/04/19 09:08	04/05/19 22:34	218-01-9	
Dibenz(a,h)anthracene	<2.9	ug/kg	62.8	2.9	5	04/04/19 09:08	04/05/19 22:34	53-70-3	
Fluoranthene	316	ug/kg	62.8	2.7	5	04/04/19 09:08	04/05/19 22:34	206-44-0	
Fluorene	<2.0	ug/kg	62.8	2.0	5	04/04/19 09:08	04/05/19 22:34	86-73-7	
Indeno(1,2,3-cd)pyrene	131	ug/kg	62.8	4.2	5	04/04/19 09:08	04/05/19 22:34	193-39-5	
Naphthalene	<4.8	ug/kg	62.8	4.8	5	04/04/19 09:08	04/05/19 22:34	91-20-3	
Phenanthrene	101	ug/kg	62.8	12.1	5	04/04/19 09:08	04/05/19 22:34	85-01-8	
Pyrene	250	ug/kg	62.8	9.6	5	04/04/19 09:08	04/05/19 22:34	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	85	%	30-125		5	04/04/19 09:08	04/05/19 22:34	321-60-8	
p-Terphenyl-d14 (S)	79	%	30-125		5	04/04/19 09:08	04/05/19 22:34	1718-51-0	
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
Acetone	<428	ug/kg	1380	428	1	04/04/19 12:06	04/04/19 19:03	67-64-1	
Allyl chloride	<57.7	ug/kg	275	57.7	1	04/04/19 12:06	04/04/19 19:03	107-05-1	
Benzene	<3.9	ug/kg	27.5	3.9	1	04/04/19 12:06	04/04/19 19:03	71-43-2	
Bromobenzene	<4.2	ug/kg	68.8	4.2	1	04/04/19 12:06	04/04/19 19:03	108-86-1	
Bromochloromethane	<23.8	ug/kg	68.8	23.8	1	04/04/19 12:06	04/04/19 19:03	74-97-5	
Bromodichloromethane	<23.5	ug/kg	68.8	23.5	1	04/04/19 12:06	04/04/19 19:03	75-27-4	
Bromoform	<104	ug/kg	275	104	1	04/04/19 12:06	04/04/19 19:03	75-25-2	
Bromomethane	<80.5	ug/kg	688	80.5	1	04/04/19 12:06	04/04/19 19:03	74-83-9	
2-Butanone (MEK)	<36.6	ug/kg	344	36.6	1	04/04/19 12:06	04/04/19 19:03	78-93-3	
n-Butylbenzene	<32.8	ug/kg	68.8	32.8	1	04/04/19 12:06	04/04/19 19:03	104-51-8	
sec-Butylbenzene	<13.2	ug/kg	68.8	13.2	1	04/04/19 12:06	04/04/19 19:03	135-98-8	
tert-Butylbenzene	<13.2	ug/kg	68.8	13.2	1	04/04/19 12:06	04/04/19 19:03	98-06-6	
Carbon tetrachloride	<32.9	ug/kg	275	32.9	1	04/04/19 12:06	04/04/19 19:03	56-23-5	
Chlorobenzene	<3.9	ug/kg	68.8	3.9	1	04/04/19 12:06	04/04/19 19:03	108-90-7	
Chloroethane	<35.8	ug/kg	688	35.8	1	04/04/19 12:06	04/04/19 19:03	75-00-3	
Chloroform	<34.4	ug/kg	68.8	34.4	1	04/04/19 12:06	04/04/19 19:03	67-66-3	
Chloromethane	<16.5	ug/kg	275	16.5	1	04/04/19 12:06	04/04/19 19:03	74-87-3	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: **FL-SB-14 (0-10ft)** Lab ID: **10469445014** Collected: 04/02/19 17:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
2-Chlorotoluene	<3.4	ug/kg	68.8	3.4	1	04/04/19 12:06	04/04/19 19:03	95-49-8	
4-Chlorotoluene	<3.5	ug/kg	68.8	3.5	1	04/04/19 12:06	04/04/19 19:03	106-43-4	
1,2-Dibromo-3-chloropropane	<240	ug/kg	688	240	1	04/04/19 12:06	04/04/19 19:03	96-12-8	
Dibromochloromethane	<8.0	ug/kg	275	8.0	1	04/04/19 12:06	04/04/19 19:03	124-48-1	
1,2-Dibromoethane (EDB)	<7.2	ug/kg	68.8	7.2	1	04/04/19 12:06	04/04/19 19:03	106-93-4	
Dibromomethane	<12.6	ug/kg	68.8	12.6	1	04/04/19 12:06	04/04/19 19:03	74-95-3	
1,2-Dichlorobenzene	<2.8	ug/kg	68.8	2.8	1	04/04/19 12:06	04/04/19 19:03	95-50-1	
1,3-Dichlorobenzene	<2.5	ug/kg	68.8	2.5	1	04/04/19 12:06	04/04/19 19:03	541-73-1	
1,4-Dichlorobenzene	<4.3	ug/kg	68.8	4.3	1	04/04/19 12:06	04/04/19 19:03	106-46-7	
Dichlorodifluoromethane	<22.3	ug/kg	275	22.3	1	04/04/19 12:06	04/04/19 19:03	75-71-8	
1,1-Dichloroethane	<7.7	ug/kg	68.8	7.7	1	04/04/19 12:06	04/04/19 19:03	75-34-3	
1,2-Dichloroethane	<7.6	ug/kg	68.8	7.6	1	04/04/19 12:06	04/04/19 19:03	107-06-2	
1,1-Dichloroethene	<20.6	ug/kg	68.8	20.6	1	04/04/19 12:06	04/04/19 19:03	75-35-4	
cis-1,2-Dichloroethene	<11.4	ug/kg	68.8	11.4	1	04/04/19 12:06	04/04/19 19:03	156-59-2	
trans-1,2-Dichloroethene	<32.2	ug/kg	68.8	32.2	1	04/04/19 12:06	04/04/19 19:03	156-60-5	
Dichlorofluoromethane	<95.1	ug/kg	688	95.1	1	04/04/19 12:06	04/04/19 19:03	75-43-4	N2
1,2-Dichloropropane	<11.9	ug/kg	68.8	11.9	1	04/04/19 12:06	04/04/19 19:03	78-87-5	
1,3-Dichloropropane	<9.5	ug/kg	68.8	9.5	1	04/04/19 12:06	04/04/19 19:03	142-28-9	
2,2-Dichloropropane	<8.6	ug/kg	275	8.6	1	04/04/19 12:06	04/04/19 19:03	594-20-7	
1,1-Dichloropropene	<31.8	ug/kg	68.8	31.8	1	04/04/19 12:06	04/04/19 19:03	563-58-6	
cis-1,3-Dichloropropene	<9.9	ug/kg	68.8	9.9	1	04/04/19 12:06	04/04/19 19:03	10061-01-5	
trans-1,3-Dichloropropene	<9.6	ug/kg	68.8	9.6	1	04/04/19 12:06	04/04/19 19:03	10061-02-6	
Diethyl ether (Ethyl ether)	<42.1	ug/kg	275	42.1	1	04/04/19 12:06	04/04/19 19:03	60-29-7	
Ethylbenzene	<3.7	ug/kg	68.8	3.7	1	04/04/19 12:06	04/04/19 19:03	100-41-4	
Hexachloro-1,3-butadiene	<16.8	ug/kg	344	16.8	1	04/04/19 12:06	04/04/19 19:03	87-68-3	
Isopropylbenzene (Cumene)	<3.1	ug/kg	68.8	3.1	1	04/04/19 12:06	04/04/19 19:03	98-82-8	
p-Isopropyltoluene	<20.9	ug/kg	68.8	20.9	1	04/04/19 12:06	04/04/19 19:03	99-87-6	
Methylene Chloride	<130	ug/kg	275	130	1	04/04/19 12:06	04/04/19 19:03	75-09-2	
4-Methyl-2-pentanone (MIBK)	<14.3	ug/kg	344	14.3	1	04/04/19 12:06	04/04/19 19:03	108-10-1	
Methyl-tert-butyl ether	<8.2	ug/kg	68.8	8.2	1	04/04/19 12:06	04/04/19 19:03	1634-04-4	
Naphthalene	<64.4	ug/kg	275	64.4	1	04/04/19 12:06	04/04/19 19:03	91-20-3	
n-Propylbenzene	<3.7	ug/kg	68.8	3.7	1	04/04/19 12:06	04/04/19 19:03	103-65-1	
Styrene	<3.1	ug/kg	68.8	3.1	1	04/04/19 12:06	04/04/19 19:03	100-42-5	
1,1,1,2-Tetrachloroethane	<21.6	ug/kg	68.8	21.6	1	04/04/19 12:06	04/04/19 19:03	630-20-6	
1,1,1,2,2-Tetrachloroethane	<12.1	ug/kg	68.8	12.1	1	04/04/19 12:06	04/04/19 19:03	79-34-5	
Tetrachloroethene	<24.2	ug/kg	68.8	24.2	1	04/04/19 12:06	04/04/19 19:03	127-18-4	
Tetrahydrofuran	<100	ug/kg	2750	100	1	04/04/19 12:06	04/04/19 19:03	109-99-9	
Toluene	<16.8	ug/kg	68.8	16.8	1	04/04/19 12:06	04/04/19 19:03	108-88-3	
1,2,3-Trichlorobenzene	<11.0	ug/kg	68.8	11.0	1	04/04/19 12:06	04/04/19 19:03	87-61-6	
1,2,4-Trichlorobenzene	<15.3	ug/kg	68.8	15.3	1	04/04/19 12:06	04/04/19 19:03	120-82-1	
1,1,1-Trichloroethane	<32.1	ug/kg	68.8	32.1	1	04/04/19 12:06	04/04/19 19:03	71-55-6	
1,1,2-Trichloroethane	<8.2	ug/kg	68.8	8.2	1	04/04/19 12:06	04/04/19 19:03	79-00-5	
Trichloroethene	<10.6	ug/kg	68.8	10.6	1	04/04/19 12:06	04/04/19 19:03	79-01-6	
Trichlorofluoromethane	<120	ug/kg	275	120	1	04/04/19 12:06	04/04/19 19:03	75-69-4	
1,2,3-Trichloropropane	<18.0	ug/kg	275	18.0	1	04/04/19 12:06	04/04/19 19:03	96-18-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: FL-SB-14 (0-10ft) **Lab ID: 10469445014** Collected: 04/02/19 17:40 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,2-Trichlorotrifluoroethane	<79.8	ug/kg	275	79.8	1	04/04/19 12:06	04/04/19 19:03	76-13-1	
1,2,4-Trimethylbenzene	<13.8	ug/kg	68.8	13.8	1	04/04/19 12:06	04/04/19 19:03	95-63-6	
1,3,5-Trimethylbenzene	<11.0	ug/kg	68.8	11.0	1	04/04/19 12:06	04/04/19 19:03	108-67-8	
Vinyl chloride	<13.5	ug/kg	27.5	13.5	1	04/04/19 12:06	04/04/19 19:03	75-01-4	
Xylene (Total)	<16.0	ug/kg	206	16.0	1	04/04/19 12:06	04/04/19 19:03	1330-20-7	

Surrogates

1,2-Dichloroethane-d4 (S)	110	%	75-125		1	04/04/19 12:06	04/04/19 19:03	17060-07-0	
Toluene-d8 (S)	106	%	75-125		1	04/04/19 12:06	04/04/19 19:03	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1	04/04/19 12:06	04/04/19 19:03	460-00-4	

Total Organic Carbon

Analytical Method: EPA 9060 Modified

Surrogates

RPD%	3.7	%	0.10	0.10	1		04/16/19 11:15		
Total Organic Carbon	22300	mg/kg	7220	2170	1		04/16/19 11:15	7440-44-0	
Total Organic Carbon	23100	mg/kg	7200	2160	1		04/16/19 11:22	7440-44-0	
Mean Total Organic Carbon	22700	mg/kg	7210	2160	1		04/16/19 11:15	7440-44-0	

Sample: Trip Blank **Lab ID: 10469445015** Collected: 04/02/19 00:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIGRO GCV									
Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil									
Gasoline Range Organics	<1.3	mg/kg	10.0	1.3	1	04/12/19 15:21	04/13/19 00:22		
Surrogates									
a,a,a-Trifluorotoluene (S)	95	%	80-150		1	04/12/19 15:21	04/13/19 00:22	98-08-8	

8260B MSV 5030 Med Level

Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B

Acetone	<311	ug/kg	1000	311	1	04/04/19 12:06	04/04/19 14:51	67-64-1	
Allyl chloride	<41.9	ug/kg	200	41.9	1	04/04/19 12:06	04/04/19 14:51	107-05-1	
Benzene	<2.8	ug/kg	20.0	2.8	1	04/04/19 12:06	04/04/19 14:51	71-43-2	
Bromobenzene	<3.1	ug/kg	50.0	3.1	1	04/04/19 12:06	04/04/19 14:51	108-86-1	
Bromochloromethane	<17.3	ug/kg	50.0	17.3	1	04/04/19 12:06	04/04/19 14:51	74-97-5	
Bromodichloromethane	<17.1	ug/kg	50.0	17.1	1	04/04/19 12:06	04/04/19 14:51	75-27-4	
Bromoform	<75.7	ug/kg	200	75.7	1	04/04/19 12:06	04/04/19 14:51	75-25-2	
Bromomethane	<58.5	ug/kg	500	58.5	1	04/04/19 12:06	04/04/19 14:51	74-83-9	
2-Butanone (MEK)	<26.6	ug/kg	250	26.6	1	04/04/19 12:06	04/04/19 14:51	78-93-3	
n-Butylbenzene	<23.8	ug/kg	50.0	23.8	1	04/04/19 12:06	04/04/19 14:51	104-51-8	
sec-Butylbenzene	<9.6	ug/kg	50.0	9.6	1	04/04/19 12:06	04/04/19 14:51	135-98-8	
tert-Butylbenzene	<9.6	ug/kg	50.0	9.6	1	04/04/19 12:06	04/04/19 14:51	98-06-6	
Carbon tetrachloride	<23.9	ug/kg	200	23.9	1	04/04/19 12:06	04/04/19 14:51	56-23-5	
Chlorobenzene	<2.8	ug/kg	50.0	2.8	1	04/04/19 12:06	04/04/19 14:51	108-90-7	
Chloroethane	<26.0	ug/kg	500	26.0	1	04/04/19 12:06	04/04/19 14:51	75-00-3	
Chloroform	<25.0	ug/kg	50.0	25.0	1	04/04/19 12:06	04/04/19 14:51	67-66-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: Trip Blank Lab ID: 10469445015 Collected: 04/02/19 00:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
Chloromethane	<12.0	ug/kg	200	12.0	1	04/04/19 12:06	04/04/19 14:51	74-87-3	
2-Chlorotoluene	<2.5	ug/kg	50.0	2.5	1	04/04/19 12:06	04/04/19 14:51	95-49-8	
4-Chlorotoluene	<2.6	ug/kg	50.0	2.6	1	04/04/19 12:06	04/04/19 14:51	106-43-4	
1,2-Dibromo-3-chloropropane	<174	ug/kg	500	174	1	04/04/19 12:06	04/04/19 14:51	96-12-8	
Dibromochloromethane	<5.8	ug/kg	200	5.8	1	04/04/19 12:06	04/04/19 14:51	124-48-1	
1,2-Dibromoethane (EDB)	<5.3	ug/kg	50.0	5.3	1	04/04/19 12:06	04/04/19 14:51	106-93-4	
Dibromomethane	<9.2	ug/kg	50.0	9.2	1	04/04/19 12:06	04/04/19 14:51	74-95-3	
1,2-Dichlorobenzene	<2.0	ug/kg	50.0	2.0	1	04/04/19 12:06	04/04/19 14:51	95-50-1	
1,3-Dichlorobenzene	<1.8	ug/kg	50.0	1.8	1	04/04/19 12:06	04/04/19 14:51	541-73-1	
1,4-Dichlorobenzene	<3.1	ug/kg	50.0	3.1	1	04/04/19 12:06	04/04/19 14:51	106-46-7	
Dichlorodifluoromethane	<16.2	ug/kg	200	16.2	1	04/04/19 12:06	04/04/19 14:51	75-71-8	
1,1-Dichloroethane	<5.6	ug/kg	50.0	5.6	1	04/04/19 12:06	04/04/19 14:51	75-34-3	
1,2-Dichloroethane	<5.5	ug/kg	50.0	5.5	1	04/04/19 12:06	04/04/19 14:51	107-06-2	
1,1-Dichloroethene	<15.0	ug/kg	50.0	15.0	1	04/04/19 12:06	04/04/19 14:51	75-35-4	
cis-1,2-Dichloroethene	<8.3	ug/kg	50.0	8.3	1	04/04/19 12:06	04/04/19 14:51	156-59-2	
trans-1,2-Dichloroethene	<23.4	ug/kg	50.0	23.4	1	04/04/19 12:06	04/04/19 14:51	156-60-5	
Dichlorofluoromethane	<69.1	ug/kg	500	69.1	1	04/04/19 12:06	04/04/19 14:51	75-43-4	N2
1,2-Dichloropropane	<8.6	ug/kg	50.0	8.6	1	04/04/19 12:06	04/04/19 14:51	78-87-5	
1,3-Dichloropropane	<6.9	ug/kg	50.0	6.9	1	04/04/19 12:06	04/04/19 14:51	142-28-9	
2,2-Dichloropropane	<6.2	ug/kg	200	6.2	1	04/04/19 12:06	04/04/19 14:51	594-20-7	
1,1-Dichloropropene	<23.1	ug/kg	50.0	23.1	1	04/04/19 12:06	04/04/19 14:51	563-58-6	
cis-1,3-Dichloropropene	<7.2	ug/kg	50.0	7.2	1	04/04/19 12:06	04/04/19 14:51	10061-01-5	
trans-1,3-Dichloropropene	<7.0	ug/kg	50.0	7.0	1	04/04/19 12:06	04/04/19 14:51	10061-02-6	
Diethyl ether (Ethyl ether)	<30.6	ug/kg	200	30.6	1	04/04/19 12:06	04/04/19 14:51	60-29-7	
Ethylbenzene	<2.7	ug/kg	50.0	2.7	1	04/04/19 12:06	04/04/19 14:51	100-41-4	
Hexachloro-1,3-butadiene	<12.2	ug/kg	250	12.2	1	04/04/19 12:06	04/04/19 14:51	87-68-3	
Isopropylbenzene (Cumene)	<2.2	ug/kg	50.0	2.2	1	04/04/19 12:06	04/04/19 14:51	98-82-8	
p-Isopropyltoluene	<15.2	ug/kg	50.0	15.2	1	04/04/19 12:06	04/04/19 14:51	99-87-6	
Methylene Chloride	<94.1	ug/kg	200	94.1	1	04/04/19 12:06	04/04/19 14:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	<10.4	ug/kg	250	10.4	1	04/04/19 12:06	04/04/19 14:51	108-10-1	
Methyl-tert-butyl ether	<6.0	ug/kg	50.0	6.0	1	04/04/19 12:06	04/04/19 14:51	1634-04-4	
Naphthalene	<46.8	ug/kg	200	46.8	1	04/04/19 12:06	04/04/19 14:51	91-20-3	
n-Propylbenzene	<2.7	ug/kg	50.0	2.7	1	04/04/19 12:06	04/04/19 14:51	103-65-1	
Styrene	<2.3	ug/kg	50.0	2.3	1	04/04/19 12:06	04/04/19 14:51	100-42-5	
1,1,1,2-Tetrachloroethane	<15.7	ug/kg	50.0	15.7	1	04/04/19 12:06	04/04/19 14:51	630-20-6	
1,1,1,2,2-Tetrachloroethane	<8.8	ug/kg	50.0	8.8	1	04/04/19 12:06	04/04/19 14:51	79-34-5	
Tetrachloroethene	<17.6	ug/kg	50.0	17.6	1	04/04/19 12:06	04/04/19 14:51	127-18-4	
Tetrahydrofuran	<72.7	ug/kg	2000	72.7	1	04/04/19 12:06	04/04/19 14:51	109-99-9	
Toluene	<12.2	ug/kg	50.0	12.2	1	04/04/19 12:06	04/04/19 14:51	108-88-3	
1,2,3-Trichlorobenzene	<8.0	ug/kg	50.0	8.0	1	04/04/19 12:06	04/04/19 14:51	87-61-6	
1,2,4-Trichlorobenzene	<11.1	ug/kg	50.0	11.1	1	04/04/19 12:06	04/04/19 14:51	120-82-1	
1,1,1-Trichloroethane	<23.3	ug/kg	50.0	23.3	1	04/04/19 12:06	04/04/19 14:51	71-55-6	
1,1,2-Trichloroethane	<6.0	ug/kg	50.0	6.0	1	04/04/19 12:06	04/04/19 14:51	79-00-5	
Trichloroethene	<7.7	ug/kg	50.0	7.7	1	04/04/19 12:06	04/04/19 14:51	79-01-6	
Trichlorofluoromethane	<87.2	ug/kg	200	87.2	1	04/04/19 12:06	04/04/19 14:51	75-69-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Sample: Trip Blank **Lab ID: 10469445015** Collected: 04/02/19 00:00 Received: 04/03/19 16:04 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,2,3-Trichloropropane	<13.1	ug/kg	200	13.1	1	04/04/19 12:06	04/04/19 14:51	96-18-4	
1,1,2-Trichlorotrifluoroethane	<58.0	ug/kg	200	58.0	1	04/04/19 12:06	04/04/19 14:51	76-13-1	
1,2,4-Trimethylbenzene	<10.0	ug/kg	50.0	10.0	1	04/04/19 12:06	04/04/19 14:51	95-63-6	
1,3,5-Trimethylbenzene	<8.0	ug/kg	50.0	8.0	1	04/04/19 12:06	04/04/19 14:51	108-67-8	
Vinyl chloride	<9.8	ug/kg	20.0	9.8	1	04/04/19 12:06	04/04/19 14:51	75-01-4	
Xylene (Total)	<11.6	ug/kg	150	11.6	1	04/04/19 12:06	04/04/19 14:51	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%	75-125		1	04/04/19 12:06	04/04/19 14:51	17060-07-0	
Toluene-d8 (S)	104	%	75-125		1	04/04/19 12:06	04/04/19 14:51	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1	04/04/19 12:06	04/04/19 14:51	460-00-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch: 598941 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006

METHOD BLANK: 3238090 Matrix: Solid
 Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	<1.3	10.0	1.3	04/11/19 18:44	
a,a,a-Trifluorotoluene (S)	%.	101	80-150		04/11/19 18:44	

LABORATORY CONTROL SAMPLE & LCSD: 3238091 3238092

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	55.2	48.7	110	97	80-120	13	20	
a,a,a-Trifluorotoluene (S)	%.				100	105	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3238294 3238295

Parameter	Units	10469975003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	<1.5	59.5	60.4	79.4	79.7	134	132	80-120	0	20	M1
a,a,a-Trifluorotoluene (S)	%.						100	100	80-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch: 599232 Analysis Method: WI MOD GRO
 QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
 Associated Lab Samples: 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014, 10469445015

METHOD BLANK: 3239710 Matrix: Solid
 Associated Lab Samples: 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014, 10469445015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	<1.3	10.0	1.3	04/12/19 18:35	
a,a,a-Trifluorotoluene (S)	%	98	80-150		04/12/19 18:35	

LABORATORY CONTROL SAMPLE & LCSD: 3239711 3239712

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	40.6	47.2	81	94	80-120	15	20	
a,a,a-Trifluorotoluene (S)	%				100	97	80-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3239780 3239781

Parameter	Units	10469445010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	mg/kg	<1.5	57.1	56.4	59.4	60.7	104	108	80-120	2	20	
a,a,a-Trifluorotoluene (S)	%						99	100	80-150			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

QC Batch: 597552 Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B Analysis Description: 7471B Mercury Solids
Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014

METHOD BLANK: 3231391 Matrix: Solid
Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0073	0.018	0.0073	04/15/19 13:02	

LABORATORY CONTROL SAMPLE: 3231392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.45	0.46	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3231393 3231394

Parameter	Units	10469445001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.025	0.58	0.56	0.62	0.60	101	103	80-120	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch:	597548	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3050	Analysis Description:	6010D Solids
Associated Lab Samples:	10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014		

METHOD BLANK: 3231375 Matrix: Solid
Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	mg/kg	<0.039	0.47	0.039	04/09/19 12:58	
Silver	mg/kg	<0.034	0.47	0.034	04/09/19 12:58	

LABORATORY CONTROL SAMPLE: 3231376

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/kg	49	49.3	101	80-120	
Silver	mg/kg	24.5	23.2	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3231377 3231378

Parameter	Units	10469445001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/kg	63.7	56.6	54.5	161	106	171	77	75-125	41	20	M1,R1
Silver	mg/kg	<0.040	28.4	27.3	24.9	23.8	88	87	75-125	5	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch:	597550	Analysis Method:	EPA 6020B
QC Batch Method:	EPA 3050	Analysis Description:	6020B Solids UPD5
Associated Lab Samples:	10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014		

METHOD BLANK:	3231383	Matrix:	Solid
Associated Lab Samples:	10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.17	0.50	0.17	04/15/19 23:07	
Cadmium	mg/kg	<0.026	0.079	0.026	04/15/19 23:07	
Chromium	mg/kg	<0.12	0.50	0.12	04/15/19 23:07	
Lead	mg/kg	<0.057	0.20	0.057	04/15/19 23:07	
Selenium	mg/kg	<0.14	0.50	0.14	04/15/19 23:07	

LABORATORY CONTROL SAMPLE: 3231384

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	45.9	46.7	102	80-120	
Cadmium	mg/kg	45.9	47.5	104	80-120	
Chromium	mg/kg	45.9	49.7	108	80-120	
Lead	mg/kg	45.9	50.7	111	80-120	
Selenium	mg/kg	45.9	46.2	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3231385 3231386

Parameter	Units	10469445001		3231386		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Arsenic	mg/kg	3.6	53.1	55.1	53.5	56.9	94	97	75-125	6	20
Cadmium	mg/kg	0.21	53.1	55.1	49.9	53.7	94	97	75-125	7	20
Chromium	mg/kg	13.6	53.1	55.1	72.9	72.3	112	107	75-125	1	20
Lead	mg/kg	25.7	53.1	55.1	63.8	73.1	72	86	75-125	14	20 M6
Selenium	mg/kg	0.85	53.1	55.1	50.7	53.3	94	95	75-125	5	20

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch:	597866	Analysis Method:	ASTM D2974
QC Batch Method:	ASTM D2974	Analysis Description:	Dry Weight / %M by ASTM D2974
Associated Lab Samples:	10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012		

SAMPLE DUPLICATE: 3232778

Parameter	Units	10469445012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.4	14.1	9	30	

SAMPLE DUPLICATE: 3232951

Parameter	Units	10469445002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	22.2	21.4	4	30	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch: 598370

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10469445013, 10469445014

SAMPLE DUPLICATE: 3235202

Parameter	Units	10469918022 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.2	13.8	3	30	

SAMPLE DUPLICATE: 3235203

Parameter	Units	10469455009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.5	5.3	3	30	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch: 597598 Analysis Method: EPA 8260B
 QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level
 Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007,
 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014,
 10469445015

METHOD BLANK: 3231503 Matrix: Solid

Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007,
 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014,
 10469445015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	<15.7	50.0	15.7	04/04/19 14:33	
1,1,1-Trichloroethane	ug/kg	<23.3	50.0	23.3	04/04/19 14:33	
1,1,2,2-Tetrachloroethane	ug/kg	<8.8	50.0	8.8	04/04/19 14:33	
1,1,2-Trichloroethane	ug/kg	<6.0	50.0	6.0	04/04/19 14:33	
1,1,2-Trichlorotrifluoroethane	ug/kg	<58.0	200	58.0	04/04/19 14:33	
1,1-Dichloroethane	ug/kg	<5.6	50.0	5.6	04/04/19 14:33	
1,1-Dichloroethene	ug/kg	<15.0	50.0	15.0	04/04/19 14:33	
1,1-Dichloropropene	ug/kg	<23.1	50.0	23.1	04/04/19 14:33	
1,2,3-Trichlorobenzene	ug/kg	<8.0	50.0	8.0	04/04/19 14:33	
1,2,3-Trichloropropane	ug/kg	<13.1	200	13.1	04/04/19 14:33	
1,2,4-Trichlorobenzene	ug/kg	<11.1	50.0	11.1	04/04/19 14:33	
1,2,4-Trimethylbenzene	ug/kg	<10.0	50.0	10.0	04/04/19 14:33	
1,2-Dibromo-3-chloropropane	ug/kg	<174	500	174	04/04/19 14:33	
1,2-Dibromoethane (EDB)	ug/kg	<5.3	50.0	5.3	04/04/19 14:33	
1,2-Dichlorobenzene	ug/kg	<2.0	50.0	2.0	04/04/19 14:33	
1,2-Dichloroethane	ug/kg	<5.5	50.0	5.5	04/04/19 14:33	
1,2-Dichloropropane	ug/kg	<8.6	50.0	8.6	04/04/19 14:33	
1,3,5-Trimethylbenzene	ug/kg	<8.0	50.0	8.0	04/04/19 14:33	
1,3-Dichlorobenzene	ug/kg	<1.8	50.0	1.8	04/04/19 14:33	
1,3-Dichloropropane	ug/kg	<6.9	50.0	6.9	04/04/19 14:33	
1,4-Dichlorobenzene	ug/kg	<3.1	50.0	3.1	04/04/19 14:33	
2,2-Dichloropropane	ug/kg	<6.2	200	6.2	04/04/19 14:33	
2-Butanone (MEK)	ug/kg	<26.6	250	26.6	04/04/19 14:33	
2-Chlorotoluene	ug/kg	<2.5	50.0	2.5	04/04/19 14:33	
4-Chlorotoluene	ug/kg	<2.6	50.0	2.6	04/04/19 14:33	
4-Methyl-2-pentanone (MIBK)	ug/kg	<10.4	250	10.4	04/04/19 14:33	
Acetone	ug/kg	<311	1000	311	04/04/19 14:33	
Allyl chloride	ug/kg	<41.9	200	41.9	04/04/19 14:33	
Benzene	ug/kg	4.4J	20.0	2.8	04/04/19 14:33	
Bromobenzene	ug/kg	<3.1	50.0	3.1	04/04/19 14:33	
Bromochloromethane	ug/kg	<17.3	50.0	17.3	04/04/19 14:33	
Bromodichloromethane	ug/kg	<17.1	50.0	17.1	04/04/19 14:33	
Bromoform	ug/kg	<75.7	200	75.7	04/04/19 14:33	
Bromomethane	ug/kg	<58.5	500	58.5	04/04/19 14:33	
Carbon tetrachloride	ug/kg	<23.9	200	23.9	04/04/19 14:33	MN
Chlorobenzene	ug/kg	<2.8	50.0	2.8	04/04/19 14:33	
Chloroethane	ug/kg	<26.0	500	26.0	04/04/19 14:33	
Chloroform	ug/kg	<25.0	50.0	25.0	04/04/19 14:33	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

METHOD BLANK: 3231503

Matrix: Solid

Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007, 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014, 10469445015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloromethane	ug/kg	<12.0	200	12.0	04/04/19 14:33	
cis-1,2-Dichloroethene	ug/kg	<8.3	50.0	8.3	04/04/19 14:33	
cis-1,3-Dichloropropene	ug/kg	<7.2	50.0	7.2	04/04/19 14:33	
Dibromochloromethane	ug/kg	<5.8	200	5.8	04/04/19 14:33	
Dibromomethane	ug/kg	<9.2	50.0	9.2	04/04/19 14:33	
Dichlorodifluoromethane	ug/kg	<16.2	200	16.2	04/04/19 14:33	
Dichlorofluoromethane	ug/kg	<69.1	500	69.1	04/04/19 14:33	N2
Diethyl ether (Ethyl ether)	ug/kg	<30.6	200	30.6	04/04/19 14:33	
Ethylbenzene	ug/kg	<2.7	50.0	2.7	04/04/19 14:33	
Hexachloro-1,3-butadiene	ug/kg	<12.2	250	12.2	04/04/19 14:33	
Isopropylbenzene (Cumene)	ug/kg	<2.2	50.0	2.2	04/04/19 14:33	
Methyl-tert-butyl ether	ug/kg	<6.0	50.0	6.0	04/04/19 14:33	
Methylene Chloride	ug/kg	<94.1	200	94.1	04/04/19 14:33	
n-Butylbenzene	ug/kg	<23.8	50.0	23.8	04/04/19 14:33	
n-Propylbenzene	ug/kg	<2.7	50.0	2.7	04/04/19 14:33	
Naphthalene	ug/kg	<46.8	200	46.8	04/04/19 14:33	
p-Isopropyltoluene	ug/kg	<15.2	50.0	15.2	04/04/19 14:33	
sec-Butylbenzene	ug/kg	<9.6	50.0	9.6	04/04/19 14:33	
Styrene	ug/kg	<2.3	50.0	2.3	04/04/19 14:33	
tert-Butylbenzene	ug/kg	<9.6	50.0	9.6	04/04/19 14:33	
Tetrachloroethene	ug/kg	<17.6	50.0	17.6	04/04/19 14:33	
Tetrahydrofuran	ug/kg	<72.7	2000	72.7	04/04/19 14:33	
Toluene	ug/kg	<12.2	50.0	12.2	04/04/19 14:33	
trans-1,2-Dichloroethene	ug/kg	<23.4	50.0	23.4	04/04/19 14:33	
trans-1,3-Dichloropropene	ug/kg	<7.0	50.0	7.0	04/04/19 14:33	
Trichloroethene	ug/kg	<7.7	50.0	7.7	04/04/19 14:33	
Trichlorofluoromethane	ug/kg	<87.2	200	87.2	04/04/19 14:33	
Vinyl chloride	ug/kg	<9.8	20.0	9.8	04/04/19 14:33	
Xylene (Total)	ug/kg	<11.6	150	11.6	04/04/19 14:33	
1,2-Dichloroethane-d4 (S)	%	102	75-125		04/04/19 14:33	
4-Bromofluorobenzene (S)	%	104	75-125		04/04/19 14:33	
Toluene-d8 (S)	%	104	75-125		04/04/19 14:33	

LABORATORY CONTROL SAMPLE: 3231504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	626	63	53-125	
1,1,1-Trichloroethane	ug/kg	1000	671	67	53-146	
1,1,2,2-Tetrachloroethane	ug/kg	1000	588	59	51-125	
1,1,2-Trichloroethane	ug/kg	1000	583	58	55-125	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	709	71	49-150	
1,1-Dichloroethane	ug/kg	1000	626	63	56-125	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

LABORATORY CONTROL SAMPLE: 3231504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethene	ug/kg	1000	680	68	48-148	
1,1-Dichloropropene	ug/kg	1000	709	71	55-142	
1,2,3-Trichlorobenzene	ug/kg	1000	618	62	47-125	
1,2,3-Trichloropropane	ug/kg	1000	608	61	52-125	
1,2,4-Trichlorobenzene	ug/kg	1000	627	63	48-125	
1,2,4-Trimethylbenzene	ug/kg	1000	684	68	51-126	
1,2-Dibromo-3-chloropropane	ug/kg	2500	1470	59	50-125	
1,2-Dibromoethane (EDB)	ug/kg	1000	605	61	52-125	
1,2-Dichlorobenzene	ug/kg	1000	638	64	50-125	
1,2-Dichloroethane	ug/kg	1000	573	57	51-125	
1,2-Dichloropropane	ug/kg	1000	606	61	57-125	
1,3,5-Trimethylbenzene	ug/kg	1000	681	68	52-127	
1,3-Dichlorobenzene	ug/kg	1000	651	65	50-128	
1,3-Dichloropropane	ug/kg	1000	595	60	55-125	
1,4-Dichlorobenzene	ug/kg	1000	621	62	51-125	
2,2-Dichloropropane	ug/kg	1000	656	66	41-136	
2-Butanone (MEK)	ug/kg	5000	2690	54	43-125	
2-Chlorotoluene	ug/kg	1000	651	65	52-126	
4-Chlorotoluene	ug/kg	1000	654	65	53-126	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	2850	57	39-125	
Acetone	ug/kg	5000	3110	62	46-136	
Allyl chloride	ug/kg	1000	585	58	48-130	
Benzene	ug/kg	1000	607	61	48-125	
Bromobenzene	ug/kg	1000	654	65	51-125	
Bromochloromethane	ug/kg	1000	639	64	52-125	
Bromodichloromethane	ug/kg	1000	605	61	51-131	
Bromoform	ug/kg	1000	589	59	52-125	
Bromomethane	ug/kg	1000	814	81	30-150	
Carbon tetrachloride	ug/kg	1000	679	68	59-129	
Chlorobenzene	ug/kg	1000	621	62	54-125	
Chloroethane	ug/kg	1000	878	88	61-132	
Chloroform	ug/kg	1000	655	66	52-125	
Chloromethane	ug/kg	1000	788	79	46-125	
cis-1,2-Dichloroethene	ug/kg	1000	632	63	54-127	
cis-1,3-Dichloropropene	ug/kg	1000	614	61	50-134	
Dibromochloromethane	ug/kg	1000	646	65	54-125	
Dibromomethane	ug/kg	1000	594	59	51-125	
Dichlorodifluoromethane	ug/kg	1000	780	78	42-125	
Dichlorofluoromethane	ug/kg	1000	786	79	30-150 N2	
Diethyl ether (Ethyl ether)	ug/kg	1000	549	55	50-127	
Ethylbenzene	ug/kg	1000	650	65	51-125	
Hexachloro-1,3-butadiene	ug/kg	1000	657	66	41-133	
Isopropylbenzene (Cumene)	ug/kg	1000	686	69	54-134	
Methyl-tert-butyl ether	ug/kg	1000	613	61	53-125	
Methylene Chloride	ug/kg	1000	627	63	48-125	
n-Butylbenzene	ug/kg	1000	684	68	49-135	
n-Propylbenzene	ug/kg	1000	702	70	55-129	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

LABORATORY CONTROL SAMPLE: 3231504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/kg	1000	599	60	51-125	
p-Isopropyltoluene	ug/kg	1000	733	73	53-134	
sec-Butylbenzene	ug/kg	1000	732	73	52-134	
Styrene	ug/kg	1000	661	66	53-128	
tert-Butylbenzene	ug/kg	1000	689	69	51-133	
Tetrachloroethene	ug/kg	1000	686	69	54-131	
Tetrahydrofuran	ug/kg	10000	6000	60	42-145	
Toluene	ug/kg	1000	633	63	51-125	
trans-1,2-Dichloroethene	ug/kg	1000	648	65	50-130	
trans-1,3-Dichloropropene	ug/kg	1000	653	65	52-125	
Trichloroethene	ug/kg	1000	650	65	55-131	
Trichlorofluoromethane	ug/kg	1000	918	92	30-150	
Vinyl chloride	ug/kg	1000	833	83	58-125	
Xylene (Total)	ug/kg	3000	1980	66	52-125	
1,2-Dichloroethane-d4 (S)	%			100	75-125	
4-Bromofluorobenzene (S)	%			101	75-125	
Toluene-d8 (S)	%			103	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3231505 3231506

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10469445004 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
1,1,1,2-Tetrachloroethane	ug/kg	<20.6	1320	1280	1510	1480	114	116	68-150	2	30
1,1,1-Trichloroethane	ug/kg	<30.6	1320	1280	1510	1490	114	117	63-150	1	30
1,1,1,2,2-Tetrachloroethane	ug/kg	<11.6	1320	1280	1460	1400	111	110	60-146	4	30
1,1,2-Trichloroethane	ug/kg	<7.9	1320	1280	1470	1400	112	110	63-143	5	30
1,1,2-Trichlorotrifluoroethane	ug/kg	<76.2	1320	1280	1420	1390	108	109	30-150	2	30
1,1-Dichloroethane	ug/kg	<7.4	1320	1280	1390	1350	105	105	63-144	3	30
1,1-Dichloroethene	ug/kg	<19.7	1320	1280	1400	1430	106	112	30-150	2	30
1,1-Dichloropropene	ug/kg	<30.3	1320	1280	1580	1590	120	124	54-150	0	30
1,2,3-Trichlorobenzene	ug/kg	<10.5	1320	1280	1500	1440	114	113	63-142	4	30
1,2,3-Trichloropropane	ug/kg	<17.2	1320	1280	1490	1390	113	109	59-147	7	30
1,2,4-Trichlorobenzene	ug/kg	<14.6	1320	1280	1470	1400	111	110	66-142	4	30
1,2,4-Trimethylbenzene	ug/kg	<13.1	1320	1280	1580	1590	119	124	65-145	1	30
1,2-Dibromo-3-chloropropane	ug/kg	<228	3300	3190	3810	3600	115	113	60-142	6	30
1,2-Dibromoethane (EDB)	ug/kg	<6.9	1320	1280	1480	1420	112	111	67-135	4	30
1,2-Dichlorobenzene	ug/kg	<2.7	1320	1280	1420	1470	108	115	68-141	4	30
1,2-Dichloroethane	ug/kg	<7.2	1320	1280	1270	1270	96	99	56-132	0	30
1,2-Dichloropropane	ug/kg	<11.3	1320	1280	1360	1350	103	106	58-150	0	30
1,3,5-Trimethylbenzene	ug/kg	<10.5	1320	1280	1570	1560	119	122	66-148	1	30
1,3-Dichlorobenzene	ug/kg	<2.4	1320	1280	1470	1480	112	116	63-148	0	30
1,3-Dichloropropane	ug/kg	<9.1	1320	1280	1460	1420	111	111	63-142	3	30
1,4-Dichlorobenzene	ug/kg	<4.1	1320	1280	1400	1390	106	109	68-140	1	30
2,2-Dichloropropane	ug/kg	<8.2	1320	1280	1490	1480	113	116	62-143	0	30

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		3231505		3231506								
Parameter	Units	10469445004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		
2-Butanone (MEK)	ug/kg	<34.9	6600	6390	7650	7470	116	117	53-138	2	30	
2-Chlorotoluene	ug/kg	<3.2	1320	1280	1490	1480	113	116	64-145	1	30	
4-Chlorotoluene	ug/kg	<3.4	1320	1280	1480	1510	112	118	63-149	2	30	
4-Methyl-2-pentanone (MIBK)	ug/kg	<13.7	6600	6390	7730	7040	117	110	47-150	9	30	
Acetone	ug/kg	<408	6600	6390	8280	7880	125	123	64-150	5	30	
Allyl chloride	ug/kg	<55.0	1320	1280	1280	1270	97	100	49-146	1	30	
Benzene	ug/kg	3.8J	1320	1280	1350	1370	102	107	63-136	1	30	
Bromobenzene	ug/kg	<4.0	1320	1280	1460	1450	111	114	63-142	1	30	
Bromochloromethane	ug/kg	<22.7	1320	1280	1400	1350	106	106	61-139	4	30	
Bromodichloromethane	ug/kg	<22.5	1320	1280	1420	1380	108	108	63-150	3	30	
Bromoform	ug/kg	<99.4	1320	1280	1440	1410	109	111	64-140	2	30	
Bromomethane	ug/kg	<76.8	1320	1280	1280	1060	95	80	56-148	19	30	
Carbon tetrachloride	ug/kg	<31.4	1320	1280	1460	1490	111	117	75-148	2	30	
Chlorobenzene	ug/kg	<3.7	1320	1280	1430	1380	108	108	62-147	4	30	
Chloroethane	ug/kg	<34.1	1320	1280	1260	1130	95	88	37-150	11	30	
Chloroform	ug/kg	<32.8	1320	1280	1440	1440	109	112	66-130	0	30	
Chloromethane	ug/kg	<15.8	1320	1280	1140	987	86	77	35-131	14	30	
cis-1,2-Dichloroethene	ug/kg	<10.9	1320	1280	1390	1390	105	109	63-143	0	30	
cis-1,3-Dichloropropene	ug/kg	<9.4	1320	1280	1440	1390	109	109	60-150	4	30	
Dibromochloromethane	ug/kg	<7.6	1320	1280	1510	1510	115	118	64-144	0	30	
Dibromomethane	ug/kg	<12.0	1320	1280	1400	1390	106	109	59-148	0	30	
Dichlorodifluoromethane	ug/kg	<21.3	1320	1280	1080	886	82	69	30-125	20	30	
Dichlorofluoromethane	ug/kg	<90.7	1320	1280	1260	1040	96	81	39-150	20	30	N2
Diethyl ether (Ethyl ether)	ug/kg	<40.2	1320	1280	1250	1210	95	95	59-149	3	30	
Ethylbenzene	ug/kg	<3.6	1320	1280	1480	1450	112	114	64-142	2	30	
Hexachloro-1,3-butadiene	ug/kg	<16.0	1320	1280	1590	1550	120	121	58-150	2	30	
Isopropylbenzene (Cumene)	ug/kg	<2.9	1320	1280	1630	1620	123	126	67-150	1	30	
Methyl-tert-butyl ether	ug/kg	<7.8	1320	1280	1430	1370	108	108	69-134	4	30	
Methylene Chloride	ug/kg	<124	1320	1280	1360	1320	103	103	56-134	3	30	
n-Butylbenzene	ug/kg	<31.3	1320	1280	1620	1600	123	125	64-150	1	30	
n-Propylbenzene	ug/kg	<3.5	1320	1280	1580	1570	120	123	65-150	0	30	
Naphthalene	ug/kg	<61.5	1320	1280	1510	1480	113	115	63-148	2	30	
p-Isopropyltoluene	ug/kg	<20.0	1320	1280	1700	1680	129	131	69-150	2	30	
sec-Butylbenzene	ug/kg	<12.6	1320	1280	1720	1700	130	133	69-150	1	30	
Styrene	ug/kg	<3.0	1320	1280	1570	1550	119	121	63-150	1	30	
tert-Butylbenzene	ug/kg	<12.6	1320	1280	1590	1600	120	125	67-150	1	30	
Tetrachloroethene	ug/kg	<23.1	1320	1280	1580	1560	120	122	62-150	2	30	
Tetrahydrofuran	ug/kg	<95.5	13200	12800	14200	13800	108	108	53-150	3	30	
Toluene	ug/kg	<16.0	1320	1280	1470	1440	110	112	61-141	1	30	
trans-1,2-Dichloroethene	ug/kg	<30.7	1320	1280	1420	1390	107	109	52-148	2	30	
trans-1,3-Dichloropropene	ug/kg	<9.1	1320	1280	1540	1450	117	114	62-142	6	30	
Trichloroethene	ug/kg	<10.1	1320	1280	1450	1420	110	112	59-150	2	30	
Trichlorofluoromethane	ug/kg	<115	1320	1280	1340	1160	101	91	30-150	14	30	
Vinyl chloride	ug/kg	<12.9	1320	1280	1260	1030	95	81	44-144	20	30	
Xylene (Total)	ug/kg	<15.2	3960	3830	4560	4570	115	119	67-145	0	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Parameter	Units	10469445004		3231505		3231506		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result							
1,2-Dichloroethane-d4 (S)	%.							99	100		75-125			
4-Bromofluorobenzene (S)	%.							100	102		75-125			
Toluene-d8 (S)	%.							104	104		75-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch: 597590 Analysis Method: EPA 8270D by SIM
 QC Batch Method: EPA 3550 Analysis Description: 8270D Solid PAH by SIM MSSV
 Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007,
 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014

METHOD BLANK: 3231475 Matrix: Solid
 Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007,
 10469445008, 10469445009, 10469445010, 10469445011, 10469445012, 10469445013, 10469445014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/kg	<0.41	10.0	0.41	04/05/19 14:27	
Acenaphthylene	ug/kg	<0.50	10.0	0.50	04/05/19 14:27	
Anthracene	ug/kg	<0.47	10.0	0.47	04/05/19 14:27	
Benzo(a)anthracene	ug/kg	<1.1	10.0	1.1	04/05/19 14:27	
Benzo(a)pyrene	ug/kg	<0.69	10.0	0.69	04/05/19 14:27	
Benzo(b)fluoranthene	ug/kg	<0.37	10.0	0.37	04/05/19 14:27	
Benzo(e)pyrene	ug/kg	<0.72	10.0	0.72	04/05/19 14:27	N2
Benzo(g,h,i)perylene	ug/kg	<0.63	10.0	0.63	04/05/19 14:27	
Benzo(k)fluoranthene	ug/kg	<0.84	10.0	0.84	04/05/19 14:27	
Chrysene	ug/kg	<1.4	10.0	1.4	04/05/19 14:27	
Dibenz(a,h)anthracene	ug/kg	<0.46	10.0	0.46	04/05/19 14:27	
Fluoranthene	ug/kg	<0.43	10.0	0.43	04/05/19 14:27	
Fluorene	ug/kg	<0.31	10.0	0.31	04/05/19 14:27	
Indeno(1,2,3-cd)pyrene	ug/kg	<0.67	10.0	0.67	04/05/19 14:27	
Naphthalene	ug/kg	<0.77	10.0	0.77	04/05/19 14:27	
Phenanthrene	ug/kg	<1.9	10.0	1.9	04/05/19 14:27	
Pyrene	ug/kg	<1.5	10.0	1.5	04/05/19 14:27	
2-Fluorobiphenyl (S)	%	78	30-125		04/05/19 14:27	
p-Terphenyl-d14 (S)	%	83	30-125		04/05/19 14:27	

LABORATORY CONTROL SAMPLE: 3231476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	26.1	78	46-125	
Acenaphthylene	ug/kg	33.3	28.3	85	44-125	
Anthracene	ug/kg	33.3	28.7	86	62-125	
Benzo(a)anthracene	ug/kg	33.3	27.2	82	53-125	
Benzo(a)pyrene	ug/kg	33.3	30.2	90	62-125	
Benzo(b)fluoranthene	ug/kg	33.3	24.4	73	51-125	
Benzo(e)pyrene	ug/kg	33.3	29.0	87	64-125	N2
Benzo(g,h,i)perylene	ug/kg	33.3	28.3	85	58-125	
Benzo(k)fluoranthene	ug/kg	33.3	31.4	94	59-125	
Chrysene	ug/kg	33.3	29.8	89	59-125	
Dibenz(a,h)anthracene	ug/kg	33.3	28.6	86	60-125	
Fluoranthene	ug/kg	33.3	32.0	96	67-125	
Fluorene	ug/kg	33.3	28.0	84	51-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	28.9	87	59-125	
Naphthalene	ug/kg	33.3	27.1	81	47-125	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

LABORATORY CONTROL SAMPLE: 3231476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phenanthrene	ug/kg	33.3	26.5	80	61-125	
Pyrene	ug/kg	33.3	27.7	83	52-125	
2-Fluorobiphenyl (S)	%.			80	30-125	
p-Terphenyl-d14 (S)	%.			85	30-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3231477 3231478

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10469413001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Acenaphthene	ug/kg	ND	38	38	36.4	37.5	96	99	30-125	3	30	
Acenaphthylene	ug/kg	ND	38	38	30.8	30.9	81	81	30-125	0	30	
Anthracene	ug/kg	ND	38	38	27.2	31.8	72	84	30-131	15	30	
Benzo(a)anthracene	ug/kg	ND	38	38	29.5	29.1	78	76	30-126	1	30	
Benzo(a)pyrene	ug/kg	ND	38	38	33.1	31.8	87	83	30-150	4	30	
Benzo(b)fluoranthene	ug/kg	ND	38	38	26.1	25.4	69	67	30-150	3	30	
Benzo(e)pyrene	ug/kg	ND	38	38	31.9	30.7	84	81	30-150	4	30	N2
Benzo(g,h,i)perylene	ug/kg	ND	38	38	31.3	30.4	82	80	30-150	3	30	
Benzo(k)fluoranthene	ug/kg	ND	38	38	34.9	34.6	92	91	30-150	1	30	
Chrysene	ug/kg	ND	38	38	34.2	32.6	90	86	30-150	5	30	
Dibenz(a,h)anthracene	ug/kg	ND	38	38	31.3	30.1	82	79	30-143	4	30	
Fluoranthene	ug/kg	ND	38	38	38.7	36.6	102	96	30-143	6	30	
Fluorene	ug/kg	ND	38	38	44.9	50.0	118	131	30-138	11	30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	38	38	31.7	30.5	83	80	30-150	4	30	
Naphthalene	ug/kg	ND	38	38	35.1	37.4	92	98	30-125	7	30	
Phenanthrene	ug/kg	0.019 mg/kg	38	38	54.3	61.6	92	111	30-142	13	30	
Pyrene	ug/kg	ND	38	38	31.8	31.7	83	83	30-149	0	30	
2-Fluorobiphenyl (S)	%.						80	80	30-125			
p-Terphenyl-d14 (S)	%.						82	83	30-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

QC Batch: 597558 Analysis Method: WI MOD DRO
 QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
 Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007

METHOD BLANK: 3231416 Matrix: Solid
 Associated Lab Samples: 10469445001, 10469445002, 10469445003, 10469445004, 10469445005, 10469445006, 10469445007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	<2.6	10.0	2.6	04/05/19 13:08	
n-Triacontane (S)	%.	93	50-150		04/05/19 13:08	

LABORATORY CONTROL SAMPLE & LCSD: 3231417 3231418

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	73.2	74.3	91	93	70-120	2	20	
n-Triacontane (S)	%.				99	99	50-150			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

QC Batch: 318468 Analysis Method: EPA 9060 Modified
QC Batch Method: EPA 9060 Modified Analysis Description: 9060 TOC Average
Associated Lab Samples: 10469445010, 10469445011, 10469445012, 10469445013, 10469445014

METHOD BLANK: 1850946 Matrix: Solid
Associated Lab Samples: 10469445010, 10469445011, 10469445012, 10469445013, 10469445014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mean Total Organic Carbon	mg/kg	<200	668	200	04/16/19 08:46	

LABORATORY CONTROL SAMPLE: 1850947

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mean Total Organic Carbon	mg/kg	120000	119000	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1850948 1850949

Parameter	Units	10469445010		1850948		1850949		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Mean Total Organic Carbon	mg/kg	9300	60900	59700	64600	70600	91	103	50-150	9	30

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1850950 1850951

Parameter	Units	10469445011		1850950		1850951		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Mean Total Organic Carbon	mg/kg	15600	94000	95200	103000	93500	93	82	50-150	10	30

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-G Pace Analytical Services - Green Bay

PASI-M Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

G+ Late peaks present outside the GRO window.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.

R1 RPD value was outside control limits.

S0 Surrogate recovery outside laboratory control limits.

S4 Surrogate recovery not evaluated against control limits due to sample dilution.

T6 High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 SL
Pace Project No.: 10469445

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10469445001	FL-SB-01-(0-10ft)	WI MOD DRO	597558	WI MOD DRO	597925
10469445002	FL-SB-02 (0-6ft)	WI MOD DRO	597558	WI MOD DRO	597925
10469445003	FL-SB-03 (0-6.5ft)	WI MOD DRO	597558	WI MOD DRO	597925
10469445004	FL-SB-04 (0-2ft)	WI MOD DRO	597558	WI MOD DRO	597925
10469445005	FL-SB-05 (0-6.5ft)	WI MOD DRO	597558	WI MOD DRO	597925
10469445006	FL-SB-06 (0-4.5ft)	WI MOD DRO	597558	WI MOD DRO	597925
10469445007	FL-SB-07 (0-4.5ft)	WI MOD DRO	597558	WI MOD DRO	597925
10469445008	FL-SB-08 (0-5ft)	WI MOD DRO	597688	WI MOD DRO	597965
10469445009	FL-SB-09 (0-8ft)	WI MOD DRO	597688	WI MOD DRO	597965
10469445010	FL-SB-10 (0-25ft)	WI MOD DRO	597688	WI MOD DRO	597965
10469445011	FL-SB-11 (0-20ft)	WI MOD DRO	597688	WI MOD DRO	597965
10469445012	FL-SB-12 (0-10ft)	WI MOD DRO	597688	WI MOD DRO	597965
10469445013	FL-SB-13 (0-6ft)	WI MOD DRO	597688	WI MOD DRO	597965
10469445014	FL-SB-14 (0-10ft)	WI MOD DRO	597688	WI MOD DRO	597965
10469445001	FL-SB-01-(0-10ft)	EPA 5030 Medium Soil	598941	WI MOD GRO	599016
10469445002	FL-SB-02 (0-6ft)	EPA 5030 Medium Soil	598941	WI MOD GRO	599016
10469445003	FL-SB-03 (0-6.5ft)	EPA 5030 Medium Soil	598941	WI MOD GRO	599016
10469445004	FL-SB-04 (0-2ft)	EPA 5030 Medium Soil	598941	WI MOD GRO	599016
10469445005	FL-SB-05 (0-6.5ft)	EPA 5030 Medium Soil	598941	WI MOD GRO	599016
10469445006	FL-SB-06 (0-4.5ft)	EPA 5030 Medium Soil	598941	WI MOD GRO	599016
10469445007	FL-SB-07 (0-4.5ft)	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445008	FL-SB-08 (0-5ft)	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445009	FL-SB-09 (0-8ft)	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445010	FL-SB-10 (0-25ft)	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445011	FL-SB-11 (0-20ft)	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445012	FL-SB-12 (0-10ft)	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445013	FL-SB-13 (0-6ft)	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445014	FL-SB-14 (0-10ft)	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445015	Trip Blank	EPA 5030 Medium Soil	599232	WI MOD GRO	599268
10469445001	FL-SB-01-(0-10ft)	EPA 3050	597548	EPA 6010D	598094
10469445002	FL-SB-02 (0-6ft)	EPA 3050	597548	EPA 6010D	598094
10469445003	FL-SB-03 (0-6.5ft)	EPA 3050	597548	EPA 6010D	598094
10469445004	FL-SB-04 (0-2ft)	EPA 3050	597548	EPA 6010D	598094
10469445005	FL-SB-05 (0-6.5ft)	EPA 3050	597548	EPA 6010D	598094
10469445006	FL-SB-06 (0-4.5ft)	EPA 3050	597548	EPA 6010D	598094
10469445007	FL-SB-07 (0-4.5ft)	EPA 3050	597548	EPA 6010D	598094
10469445008	FL-SB-08 (0-5ft)	EPA 3050	597548	EPA 6010D	598094
10469445009	FL-SB-09 (0-8ft)	EPA 3050	597548	EPA 6010D	598094
10469445010	FL-SB-10 (0-25ft)	EPA 3050	597548	EPA 6010D	598094
10469445011	FL-SB-11 (0-20ft)	EPA 3050	597548	EPA 6010D	598094
10469445012	FL-SB-12 (0-10ft)	EPA 3050	597548	EPA 6010D	598094
10469445013	FL-SB-13 (0-6ft)	EPA 3050	597548	EPA 6010D	598094
10469445014	FL-SB-14 (0-10ft)	EPA 3050	597548	EPA 6010D	598094
10469445001	FL-SB-01-(0-10ft)	EPA 3050	597550	EPA 6020B	599032
10469445002	FL-SB-02 (0-6ft)	EPA 3050	597550	EPA 6020B	599032
10469445003	FL-SB-03 (0-6.5ft)	EPA 3050	597550	EPA 6020B	599032

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10469445004	FL-SB-04 (0-2ft)	EPA 3050	597550	EPA 6020B	599032
10469445005	FL-SB-05 (0-6.5ft)	EPA 3050	597550	EPA 6020B	599032
10469445006	FL-SB-06 (0-4.5ft)	EPA 3050	597550	EPA 6020B	599032
10469445007	FL-SB-07 (0-4.5ft)	EPA 3050	597550	EPA 6020B	599032
10469445008	FL-SB-08 (0-5ft)	EPA 3050	597550	EPA 6020B	599032
10469445009	FL-SB-09 (0-8ft)	EPA 3050	597550	EPA 6020B	599032
10469445010	FL-SB-10 (0-25ft)	EPA 3050	597550	EPA 6020B	599032
10469445011	FL-SB-11 (0-20ft)	EPA 3050	597550	EPA 6020B	599032
10469445012	FL-SB-12 (0-10ft)	EPA 3050	597550	EPA 6020B	599032
10469445013	FL-SB-13 (0-6ft)	EPA 3050	597550	EPA 6020B	599032
10469445014	FL-SB-14 (0-10ft)	EPA 3050	597550	EPA 6020B	599032
10469445001	FL-SB-01-(0-10ft)	EPA 7471B	597552	EPA 7471B	597976
10469445002	FL-SB-02 (0-6ft)	EPA 7471B	597552	EPA 7471B	597976
10469445003	FL-SB-03 (0-6.5ft)	EPA 7471B	597552	EPA 7471B	597976
10469445004	FL-SB-04 (0-2ft)	EPA 7471B	597552	EPA 7471B	597976
10469445005	FL-SB-05 (0-6.5ft)	EPA 7471B	597552	EPA 7471B	597976
10469445006	FL-SB-06 (0-4.5ft)	EPA 7471B	597552	EPA 7471B	597976
10469445007	FL-SB-07 (0-4.5ft)	EPA 7471B	597552	EPA 7471B	597976
10469445008	FL-SB-08 (0-5ft)	EPA 7471B	597552	EPA 7471B	597976
10469445009	FL-SB-09 (0-8ft)	EPA 7471B	597552	EPA 7471B	597976
10469445010	FL-SB-10 (0-25ft)	EPA 7471B	597552	EPA 7471B	597976
10469445011	FL-SB-11 (0-20ft)	EPA 7471B	597552	EPA 7471B	597976
10469445012	FL-SB-12 (0-10ft)	EPA 7471B	597552	EPA 7471B	597976
10469445013	FL-SB-13 (0-6ft)	EPA 7471B	597552	EPA 7471B	597976
10469445014	FL-SB-14 (0-10ft)	EPA 7471B	597552	EPA 7471B	597976
10469445001	FL-SB-01-(0-10ft)	ASTM D2974	597866		
10469445002	FL-SB-02 (0-6ft)	ASTM D2974	597866		
10469445003	FL-SB-03 (0-6.5ft)	ASTM D2974	597866		
10469445004	FL-SB-04 (0-2ft)	ASTM D2974	597866		
10469445005	FL-SB-05 (0-6.5ft)	ASTM D2974	597866		
10469445006	FL-SB-06 (0-4.5ft)	ASTM D2974	597866		
10469445007	FL-SB-07 (0-4.5ft)	ASTM D2974	597866		
10469445008	FL-SB-08 (0-5ft)	ASTM D2974	597866		
10469445009	FL-SB-09 (0-8ft)	ASTM D2974	597866		
10469445010	FL-SB-10 (0-25ft)	ASTM D2974	597866		
10469445011	FL-SB-11 (0-20ft)	ASTM D2974	597866		
10469445012	FL-SB-12 (0-10ft)	ASTM D2974	597866		
10469445013	FL-SB-13 (0-6ft)	ASTM D2974	598370		
10469445014	FL-SB-14 (0-10ft)	ASTM D2974	598370		
10469445001	FL-SB-01-(0-10ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445002	FL-SB-02 (0-6ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445003	FL-SB-03 (0-6.5ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445004	FL-SB-04 (0-2ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445005	FL-SB-05 (0-6.5ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445006	FL-SB-06 (0-4.5ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445007	FL-SB-07 (0-4.5ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445008	FL-SB-08 (0-5ft)	EPA 3550	597590	EPA 8270D by SIM	597870

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 SL

Pace Project No.: 10469445

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10469445009	FL-SB-09 (0-8ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445010	FL-SB-10 (0-25ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445011	FL-SB-11 (0-20ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445012	FL-SB-12 (0-10ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445013	FL-SB-13 (0-6ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445014	FL-SB-14 (0-10ft)	EPA 3550	597590	EPA 8270D by SIM	597870
10469445001	FL-SB-01-(0-10ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445002	FL-SB-02 (0-6ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445003	FL-SB-03 (0-6.5ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445004	FL-SB-04 (0-2ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445005	FL-SB-05 (0-6.5ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445006	FL-SB-06 (0-4.5ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445007	FL-SB-07 (0-4.5ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445008	FL-SB-08 (0-5ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445009	FL-SB-09 (0-8ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445010	FL-SB-10 (0-25ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445011	FL-SB-11 (0-20ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445012	FL-SB-12 (0-10ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445013	FL-SB-13 (0-6ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445014	FL-SB-14 (0-10ft)	EPA 5035/5030B	597598	EPA 8260B	597673
10469445015	Trip Blank	EPA 5035/5030B	597598	EPA 8260B	597673
10469445010	FL-SB-10 (0-25ft)	EPA 9060 Modified	318468		
10469445010	FL-SB-10 (0-25ft)	EPA 9060 Modified	318469		
10469445011	FL-SB-11 (0-20ft)	EPA 9060 Modified	318468		
10469445011	FL-SB-11 (0-20ft)	EPA 9060 Modified	318469		
10469445012	FL-SB-12 (0-10ft)	EPA 9060 Modified	318468		
10469445012	FL-SB-12 (0-10ft)	EPA 9060 Modified	318469		
10469445013	FL-SB-13 (0-6ft)	EPA 9060 Modified	318468		
10469445013	FL-SB-13 (0-6ft)	EPA 9060 Modified	318469		
10469445014	FL-SB-14 (0-10ft)	EPA 9060 Modified	318468		
10469445014	FL-SB-14 (0-10ft)	EPA 9060 Modified	318469		

REPORT OF LABORATORY ANALYSIS

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Minnesota Pollution Control Agency

Chain-of-Custody Form revision 2013.0909

Work Order Number:

Turnaround Time:

WO# 10469445



10469445

of 2

LAB USE ONLY

Facility Code: MNSW-057	Program Code (MDH Lab Only):	Lab Name:
Project Name: 19-01567 MPCA Freeway LF 2019 Soils/Solids	Project Task Code: PRJ07786	Address: 1700 SE Elm Street
Project Manager: Brad Jacobson	612-607-6375	EPIC PROFILE #: 38716 Line 1
Potential Hazard?	If yes, add information to Sampler Comments Section	
		Phone No: 612-607-6400

SAMPLE DETAILS

SAMPLE TYPE CODES	LAB MATRIX CODES	FIELD MATRIX CODES	ANALYSIS REQUESTED
Sample-Routine Sample S-IVP-Integrated Vertical Profile Sample S-CWOP-Composite Sample	QC-FB=Field Blank Sample QC-FR=Field Replicate Sample QC-TB=Trip Blank Sample	DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe AR=Air BL=Biological Material OT=Other TS=Tissue	Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Metals 6020/6010 / Mercury 7471 - QAPP Table 3b	8260 MLS / GRO - QAPP Table 3b	8270PAH / DRO - QAPP Table 3b	TOC 9060A	Grain Size ASTM D422 Sieve & Hydrometer	Lab Sample No.	#
FL-SB-01 (0-10 ft)	Sample	4/2/19	0725			C	SD		N		8	X	X	X				W01	1
FL-SB-02 (0-6 ft)	Sample	4/2/19	1000			C	SD		N		8	X	X	X				W02	2
FL-SB-03 (0-6.5 ft)	Sample	4/2/19	1025			C	SD		N		8	X	X	X				W03	3
FL-SB-04 (0-2 ft)	Sample	4/2/19	1045			C	SD		N		8	X	X	X				W04	4
FL-SB-05 (0-6.5 ft)	Sample	4/2/19	1115			C	SD		N		8	X	X	X				W05	5
FL-SB-06 (0-4.5 ft)	Sample	4/2/19	1140			C	SD		N		8	X	X	X				W06	6
FL-SB-07 (0-4.5 ft)	Sample	4/2/19	1220			C	SD		N		8	X	X	X				W07	7
FL-SB-08 (0-5 ft)	Sample	4/2/19	1320			C	SD		N		8	X	X	X				W08	8
FL-SB-09 (0-8 ft)	Sample	4/2/19	1430			C	SD		N		8	X	X	X				W09	9
FL-SB-10 (0-2.5 ft)	Sample	4/2/19	1515			C	SD		N	(2) Extra 4 oz Jars	10	X	X	X	X	X		W10	10

Sampled By: Dave Anderson / Chris Pelosi
 Sampler's Signature: *Dave Anderson*
 Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <i>Dave Anderson / Pace Analytical</i>	<i>4/3/19</i>	<i>W. R. Pae</i>	<i>4/13/19 1609</i>

Run ASTM D422 if (1) 4 oz Jar is sufficient sample volume.

T=6.5, 4.2, 1.6



Minnesota Pollution Control Agency

Chain-of-Custody Form revision 2013.0909

Work Order Number:

COC Type:

Page: 2 of 2

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MNSW-057

Program Code (MDH Lab Only):

Lab Name: Pace Analytical - Minneapolis, MN

Project Name: 19-01567 MPCA Freeway LF 2019 Soils/Solids

Project Task Code: PRJ07786

Address: 1700 SE Elm Street

Project Manager: Brad Jacobson

612-607-6375

EPIC PROFILE #: 38716 Line 1

Minneapolis

MN

55414

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wtr-Ground=Groundwater
Wtr-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	PRESERV.	ANALYSIS					Lab Sample No.	#
													Metals 6020/6010 / Mercury 7471 - QAPP Table 3b	8260 MILS / GRO - QAPP Table 3b	8270PAH / DRO - QAPP Table 3b	TOC 9060A	Grain Size ASTM D422 Sieve & Hydrometer		
FL-SB-11 (0-20 ft)	Sample	4/2/19	1600			C	SD		N	(2) Extra 4oz Jars (1) Bag for ASTM D422	11		X	X	X	X	X	011	1
FL-SB-12 (0-10 ft)	Sample	4/2/19	1640			C	SD		N	(2) Extra 4oz Jars (1) Bag for ASTM D422	11		X	X	X	X	X	012	2
FL-SB-13 (0-6 ft)	Sample	4/2/19	1710			C	SD		N	(2) Extra 4oz Jars (1) Bag for ASTM D422	11		X	X	X	X	X	013	3
FL-SB-14 (0-10 ft)	Sample	4/2/19	1740			C	SD		N	(2) Extra 4oz Jars (1) bag for ASTM D422	11		X	X	X	X	X	014	4
									N										5
									N										6
									N										7
									N										8
									N										9
									N										10

Sampled By: Dave Anderson / Chris Pelosi

Sampler's Signature: *Dave Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <i>Dave Anderson / Pace Analytical</i>	<i>4/3/19</i>	<i>Turn Lane</i>	<i>4/2/19 1600</i>

T-6.5.17.2.1.6

Sample Condition Upon Receipt

Client Name: Pace Field/MPCA Project #: _____

WO#: 10469445
 PM: JMA Due Date: 04/17/19
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Pace Speedee Commercial See Exception

Tracking Number: _____
 Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer: G87A9155100842 G87A9170600254 Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>4.2, 1.6</u> °C	Average Corrected Temp (no temp blank only): <u>4.2/1.6</u> °C	See Exceptions <input type="checkbox"/>
Correction Factor: <u>JMK</u>	Cooler Temp Corrected w/temp blank: <u>6.5, 4.2, 1.6</u> °C		

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: FE 4/3/19
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: _____ See Exception <input type="checkbox"/>
Matrix: <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12. Sample # <input type="checkbox"/> NaOH <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No See Exception <input type="checkbox"/>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Chlorine? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased): <u>111218-3</u>

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: Temp okay for plastic bag containers received over 6 degrees C. - Grain Size analysis only.

Project Manager Review: [Signature] Date: 04/04/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: [Signature]



Document Name:
SCUR Exception Form – Coolers Above 6°C

Document Revised: 04Feb2019
Page 1 of 1

Document No.:
F-MN-C-298-Rev.01

Issuing Authority:
Pace Minnesota Quality Office

During sample triage, this form is to be placed in each cooler that arrives above 6.0 degrees Celsius

SCUR Exceptions:

Workorder #:

Out of Temp Sample IDs	Container Type	# of Containers	PM-Notified? <input type="checkbox"/> Yes <input type="checkbox"/> No
FL-SB-11 (6-20st)	PB	1	If yes, indicate who was contacted/date/time. If no, indicate reason why. <i>Notified upon login</i>
FL-SB-12 (0-10st)	"	1	
FL-SB-13 (0-6st)	"	1	
FL-SB-14 (0-10st)	"	1	
			Multiple Cooler Project? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If you answered yes, fill out information to the left.

No Temp Blank		
Read Temp	Corrected Temp	Average Temp
5.6		6.5
5.5		
7.4		
7.5		

Other Issues

Issue Type:	Container Type	# of Containers
Sample ID	Type	Containers

Tracking Number	

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preserv.	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance after addition?	Initials
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	



During sample triage, this form is to be placed in each cooler that arrives above 6.0 degrees Celsius

SCUR Exceptions:

Workorder #:

Out of Temp Sample IDs	Container Type	# of Containers	PM Notified? <input type="checkbox"/> Yes <input type="checkbox"/> No																		
			If yes, indicate who was contacted/date/time. If no, indicate reason why.																		
			Multiple Cooler Project? <input type="checkbox"/> Yes <input type="checkbox"/> No If you answered yes, fill out information to the left.																		
			<table border="1"> <thead> <tr> <th colspan="3">No Temp Blank</th> </tr> <tr> <th>Read Temp</th> <th>Corrected Temp</th> <th>Average Temp</th> </tr> </thead> <tbody> <tr> <td>3.2</td> <td></td> <td>4.2</td> </tr> <tr> <td>4.9</td> <td></td> <td></td> </tr> <tr> <td>4.2</td> <td></td> <td></td> </tr> <tr> <td>4.3</td> <td></td> <td></td> </tr> </tbody> </table>	No Temp Blank			Read Temp	Corrected Temp	Average Temp	3.2		4.2	4.9			4.2			4.3		
No Temp Blank																					
Read Temp	Corrected Temp	Average Temp																			
3.2		4.2																			
4.9																					
4.2																					
4.3																					

Other Issues

Issue Type:	Container Type	# of Containers
Sample ID		

Tracking Number	

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preserv.	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance after addition?	Initials
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	

WO#: 12123315

Chain of Custody

PM: CLJ Due Date: 04/17/19
 CLIENT: PACE MPLS

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN
 Cert. Needed: Yes N
 Owner Received Date: 4/3/2019 Results Requested By: 4/17/2019

Workorder: 10469445 Workorder Name: 19-01567 MPCA Freeway LF 19 SL

Report To		Subcontract To				Requested Analysis																		
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																						
						TOC by 9060																		
						LAB USE ONLY																		
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved IGFU	Preserved Containers																	
1	FL-SB-10 (0-25ft)	PS	4/2/2019 15:15	10469445010	Solid	1																		
2	FL-SB-11 (0-20ft)	PS	4/2/2019 16:00	10469445011	Solid	1																		
3	FL-SB-12 (0-10ft)	PS	4/2/2019 16:40	10469445012	Solid	1																		
4	FL-SB-13 (0-6ft)	PS	4/2/2019 17:10	10469445013	Solid	1																		
5	FL-SB-14 (0-10ft)	PS	4/2/2019 17:40	10469445014	Solid	1																		

Transfers					Comments														
Released By	Date/Time	Received By	Date/Time																
<i>[Signature]</i>	4/4/19 12:45	<i>[Signature]</i>	4/4/19 12:30																
<i>[Signature]</i>	4/4/19 15:10	<i>[Signature]</i>	4/4/19 15:10																
<i>[Signature]</i>	4/5/19 9:50	<i>[Signature]</i>	4/5/19 9:50																
Cooler Temperature on Receipt 2.1 °C					Custody Seal <input checked="" type="checkbox"/> or N					Received on Ice <input checked="" type="checkbox"/> or N					Samples Intact <input checked="" type="checkbox"/> or N				

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Katie Rhoads 4/5/19 11:32
 Received By: *[Signature]* 4/5/19 11:32 2.6°C

Sample Condition Upon Receipt

Client Name: Pace MN Project #: **WO# : 12123315**



Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.3 Cooler Temp Corrected °C: 2.6 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: RH 4/5/19

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>5C</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Katie Richards Date: 4/5/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Owner Received Date: 4/3/2019 Results Requested By: 4/17/2019



Workorder: 10469445 Workorder Name: 19-01567 MPCA Freeway LF 19 SL

Report To	Subcontract To	Requested Analysis
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436	Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436	

Preserved Containers			
Item	Sample ID	Sample Type	Collect Date/Time
1	FL-SB-10 (0-25ft)	PS	4/2/2019 15:15
2	FL-SB-11 (0-20ft)	PS	4/2/2019 16:00
3	FL-SB-12 (0-10ft)	PS	4/2/2019 16:40
4	FL-SB-13 (0-6ft)	PS	4/2/2019 17:10
5	FL-SB-14 (0-10ft)	PS	4/2/2019 17:40

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved I-CELL	TOC by 9060A	LAB USE ONLY
1	FL-SB-10 (0-25ft)	PS	4/2/2019 15:15	10469445010	Solid	1	X	001
2	FL-SB-11 (0-20ft)	PS	4/2/2019 16:00	10469445011	Solid	1	X	002
3	FL-SB-12 (0-10ft)	PS	4/2/2019 16:40	10469445012	Solid	1	X	003
4	FL-SB-13 (0-6ft)	PS	4/2/2019 17:10	10469445013	Solid	1	X	004
5	FL-SB-14 (0-10ft)	PS	4/2/2019 17:40	10469445014	Solid	1	X	005

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	Vetrico Charles	4/9/19 14:35			
2	FedEx	4/10/19 10:30	JMM [Signature]	4/10/19 10:30	
3					

Cooler Temperature on Receipt 2 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Preservation Receipt Form

Client Name: Pace Mn

Project # 60185570

All containers needing preservation have been checked and noted below: Yes No N/A

Lab Lot# of pH paper:

Lab Std #ID of preservation (if pH adjusted):

Initial when completed:

Date/Time:

Pace Lab #	Glass						Plastic						Vials					Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)																
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU								SP5T	ZPLC	GN													
001																																														
002																																													2.5 / 5 / 10	
003																																												2.5 / 5 / 10		
004																																												2.5 / 5 / 10		
005																																												2.5 / 5 / 10		
006																																												2.5 / 5 / 10		
007																																												2.5 / 5 / 10		
008																																												2.5 / 5 / 10		
009																																												2.5 / 5 / 10		
010																																												2.5 / 5 / 10		
011																																												2.5 / 5 / 10		
012																																												2.5 / 5 / 10		
013																																													2.5 / 5 / 10	
014																																													2.5 / 5 / 10	
015																																													2.5 / 5 / 10	
016																																														2.5 / 5 / 10
017																																														2.5 / 5 / 10
018																																														2.5 / 5 / 10
019																																														2.5 / 5 / 10
020																																														2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : Yes No N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL	SP5T	120 mL plastic Na Thiosulfate
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	ZPLC	ziploc bag
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	GN:	
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4				



1241 Bellevue Street, Green Bay, WI 54302

Document Name:
Sample Condition Upon Receipt (SCUR)
Document No.:
F-GB-C-031-Rev.07

Document Revised: 25Apr2018
Issuing Authority:
Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace Mn

Project #:
WO#: 40185570

40185570

Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

Tracking #: 7749 2566 9800

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 38 Type of Ice: Wet Blue Dry None

Cooler Temperature Uncorr: 2 /Corr: 2 Samples on ice, cooling process has begun

Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 4-10-19
Initials: JL

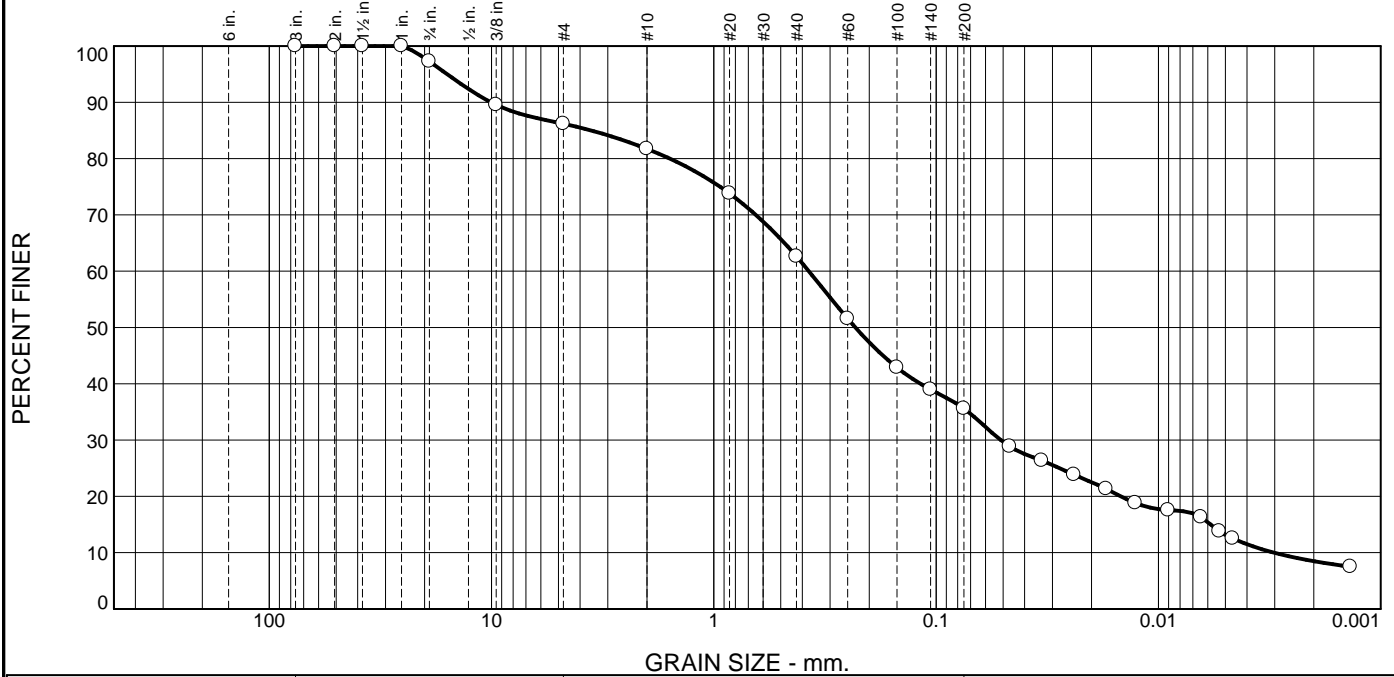
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>J RWD</u> <u>4-10-19 JK</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>original client no times</u> <u>4-10-19 JK</u>
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____ If checked, see attached form for additional comments
Comments/ Resolution: _____

Project Manager Review: Date: 4/10/19

GZ260406-001, FL-SB-11 GS ChartReport.pdf
GZ260406-001, FL-SB-11 GS TestData.pdf
GZ260406-002, FL-SB-12 GS ChartReport.pdf
GZ260406-002, FL-SB-12 GS TestData.pdf
GZ260406-003, FL-SB-13 GS ChartReport.pdf
GZ260406-003, FL-SB-13 GS TestData.pdf
GZ260406-004, FL-SB-14 GS ChartReport.pdf
GZ260406-004, FL-SB-14 GS TestData.pdf
260406 COC.pdf

ASTM D6913 / ASTM D7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	3	11	4	19	27	23	13

TEST RESULTS (ASTM D6913/D7928)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100		
2	100		
1.5	100		
1	100		
.75	97		
.375	90		
#4	86		
#10	82		
#20	74		
#40	63		
#60	52		
#100	43		
#140	39		
#200	36		
0.0467 mm.	29		
0.0335 mm.	26		
0.0240 mm.	24		
0.0172 mm.	21		
0.0127 mm.	19		
0.0090 mm.	18		
0.0064 mm.	16		
0.0053 mm.	14		
0.0046 mm.	13		
0.0014 mm.	7.5		

* (no specification provided)

Material Description

silty sand

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-4(0)

Coefficients

D₉₀= 10.0638 D₈₅= 3.5709 D₆₀= 0.3739
D₅₀= 0.2310 D₃₀= 0.0512 D₁₅= 0.0058
D₁₀= 0.0030 C_u= 123.51 C_c= 2.32

Remarks

Water Content (ASTM D2216): 16.1%
F.M.=2.00

Date Received: 4/9/19 Date Tested: 4/15/19

Tested By: GMK & RRW

Checked By: Gina Koski

Title: Lab Analyst

ASTM D7928 Hydrometer analyzed upon client request.

Location: FL-SB-11 (0-20')	Date Sampled: 4/2/19
Sample Number: 260406-001	
Northeast Technical Services	Client: Pace Analytical MPLS
Virginia, MN	Project: 19-01567 MPCA Freeway LF 19 SL
Project No: 10613-2019	Figure

GRAIN SIZE DISTRIBUTION TEST DATA

4/16/2019

Client: Pace Analytical MPLS

Project: 19-01567 MPCA Freeway LF 19 SL

Project Number: 10613-2019

Location: FL-SB-11 (0-20')

Sample Number: 260406-001

Material Description: silty sand

Sample Date: 4/2/19

Date Received: 4/9/19 **PL:** NP

LL: NV

USCS Classification: SM

AASHTO Classification: A-4(0)

Grain Size Test Method: ASTM D6913/D7928

Testing Remarks: Water Content (ASTM D2216): 16.1%

Tested By: GMK & RRW

Test Date: 4/15/19

Checked By: Gina Koski

Title: Lab Analyst

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
1098.20	536.30	3	0.00	0.00	100
		2	0.00	0.00	100
		1.5	0.00	0.00	100
		1	0.00	0.00	100
		.75	15.40	0.00	97
		.375	43.40	0.00	90
		#4	18.80	0.00	86
		#10	25.10	0.00	82
65.00	0.00	#20	6.30	0.00	74
		#40	8.90	0.00	63
		#60	8.80	0.00	52
		#100	6.90	0.00	43
		#140	3.10	0.00	39
		#200	2.70	0.00	36

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 82

Weight of hydrometer sample = 65.0

Automatic temperature correction

Composite correction (fluid density and meniscus height) at 20 deg. C = -5

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.294964 - 0.164 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	28.0	23.0	0.0136	28.0	11.7	0.0467	28.9
2.00	20.0	26.0	21.0	0.0136	26.0	12.0	0.0335	26.4
4.00	20.0	24.0	19.0	0.0136	24.0	12.4	0.0240	23.8
8.00	20.0	22.0	17.0	0.0136	22.0	12.7	0.0172	21.3
15.00	20.0	20.0	15.0	0.0136	20.0	13.0	0.0127	18.8
30.00	20.0	19.0	14.0	0.0136	19.0	13.2	0.0090	17.6
60.00	20.0	18.0	13.0	0.0136	18.0	13.3	0.0064	16.3
90.00	20.0	16.0	11.0	0.0136	16.0	13.7	0.0053	13.8
120.00	20.0	15.0	10.0	0.0136	15.0	13.8	0.0046	12.5
1440.00	20.0	11.0	6.0	0.0136	11.0	14.5	0.0014	7.5

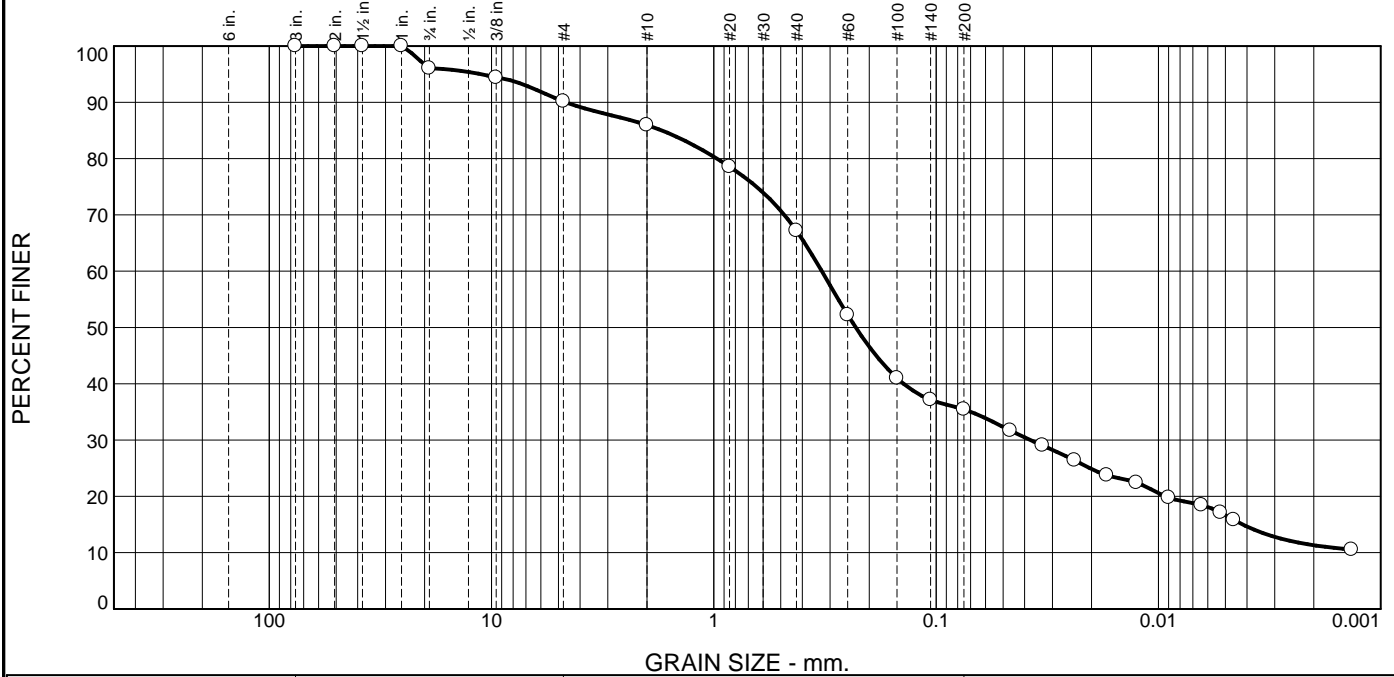
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	3	11	14	4	19	27	50	23	13	36

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.0030	0.0058	0.0148	0.0512	0.1177	0.2310	0.3739	1.5779	3.5709	10.0638	15.8361

Fineness Modulus	C _u	C _c
2.00	123.51	2.32

ASTM D6913 / ASTM D7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	4	6	4	19	32	18	17

TEST RESULTS (ASTM D6913/D7928)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100		
2	100		
1.5	100		
1	100		
.75	96		
.375	94		
#4	90		
#10	86		
#20	79		
#40	67		
#60	52		
#100	41		
#140	37		
#200	35		
0.0464 mm.	32		
0.0332 mm.	29		
0.0238 mm.	26		
0.0171 mm.	24		
0.0125 mm.	22		
0.0090 mm.	20		
0.0064 mm.	18		
0.0053 mm.	17		
0.0046 mm.	16		
0.0014 mm.	11		

* (no specification provided)

Material Description

silty sand

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D₉₀= 4.6358 D₈₅= 1.7158 D₆₀= 0.3268
D₅₀= 0.2300 D₃₀= 0.0377 D₁₅= 0.0042
D₁₀= C_u= C_c=

Remarks

Water Content (ASTM D2216): 21.5%
F.M.=1.78

Date Received: 4/9/19 Date Tested: 4/15/19

Tested By: GMK & RRW

Checked By: Gina Koski

Title: Lab Analyst

ASTM D7928 Hydrometer analyzed upon client request.

Location: FL-SB-12 (0-10')
Sample Number: 260406-002

Date Sampled: 4/2/19

Northeast Technical Services

Virginia, MN

Client: Pace Analytical MPLS
Project: 19-01567 MPCA Freeway LF 19 SL

Project No: 10613-2019

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

4/16/2019

Client: Pace Analytical MPLS

Project: 19-01567 MPCA Freeway LF 19 SL

Project Number: 10613-2019

Location: FL-SB-12 (0-10')

Sample Number: 260406-002

Material Description: silty sand

Sample Date: 4/2/19

Date Received: 4/9/19 **PL:** NP

LL: NV

USCS Classification: SM

AASHTO Classification: A-2-4(0)

Grain Size Test Method: ASTM D6913/D7928

Testing Remarks: Water Content (ASTM D2216): 21.5%

Tested By: GMK & RRW

Test Date: 4/15/19

Checked By: Gina Koski

Title: Lab Analyst

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer		
941.00	515.30	3	0.00	0.00	100		
		2	0.00	0.00	100		
		1.5	0.00	0.00	100		
		1	0.00	0.00	100		
		.75	16.80	0.00	96		
		.375	7.10	0.00	94		
		#4	18.00	0.00	90		
		#10	17.90	0.00	86		
		65.00	0.00	#20	5.60	0.00	79
				#40	8.60	0.00	67
#60	11.30			0.00	52		
#100	8.50			0.00	41		
#140	2.90			0.00	37		
#200	1.30			0.00	35		

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 86

Weight of hydrometer sample = 65.0

Automatic temperature correction

Composite correction (fluid density and meniscus height) at 20 deg. C = -5

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.294964 - 0.164 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	29.0	24.0	0.0136	29.0	11.5	0.0464	31.7
2.00	20.0	27.0	22.0	0.0136	27.0	11.9	0.0332	29.0
4.00	20.0	25.0	20.0	0.0136	25.0	12.2	0.0238	26.4
8.00	20.0	23.0	18.0	0.0136	23.0	12.5	0.0171	23.7
15.00	20.0	22.0	17.0	0.0136	22.0	12.7	0.0125	22.4
30.00	20.0	20.0	15.0	0.0136	20.0	13.0	0.0090	19.8
60.00	20.0	19.0	14.0	0.0136	19.0	13.2	0.0064	18.5
90.00	20.0	18.0	13.0	0.0136	18.0	13.3	0.0053	17.1
120.00	20.0	17.0	12.0	0.0136	17.0	13.5	0.0046	15.8
1443.00	20.0	13.0	8.0	0.0136	13.0	14.2	0.0014	10.5

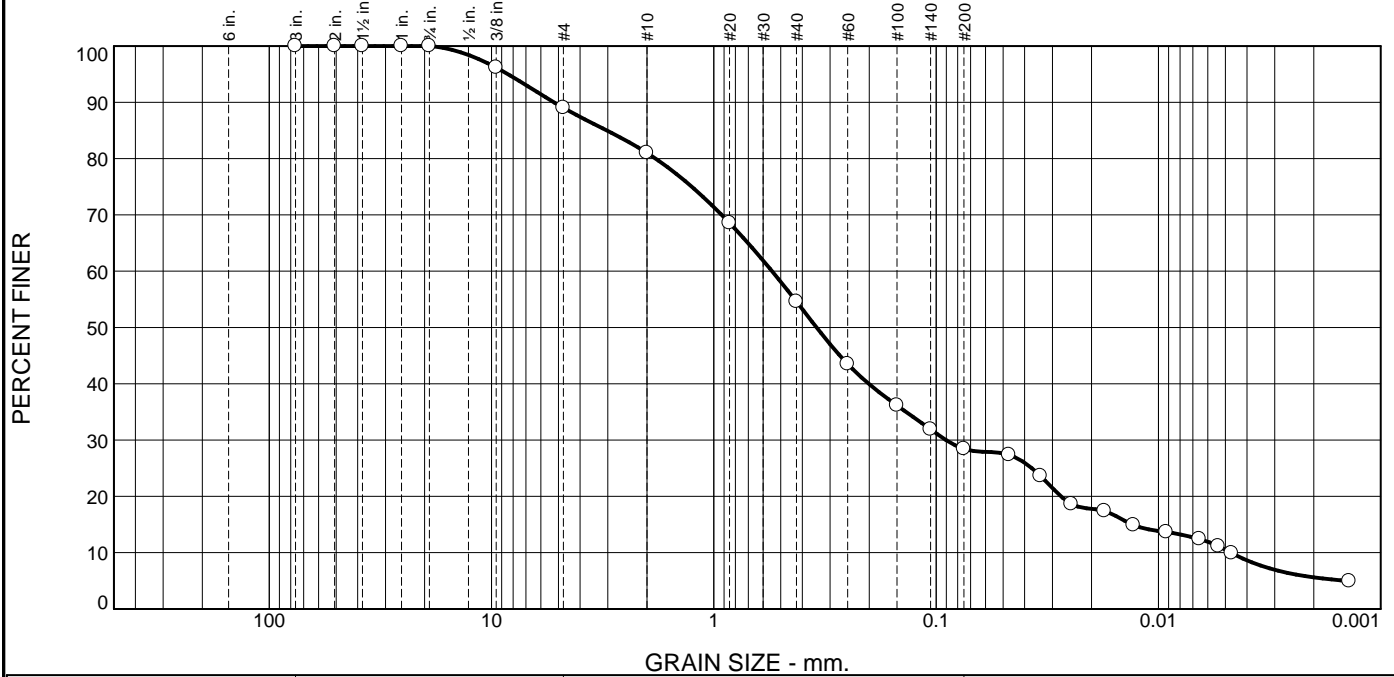
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	4	6	10	4	19	32	55	18	17	35

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
		0.0042	0.0093	0.0377	0.1402	0.2300	0.3268	0.9696	1.7158	4.6358	11.1903

Fineness Modulus
1.78

ASTM D6913 / ASTM D7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	11	8	26	27	17	11

TEST RESULTS (ASTM D6913/D7928)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100		
2	100		
1.5	100		
1	100		
.75	100		
.375	96		
#4	89		
#10	81		
#20	69		
#40	55		
#60	43		
#100	36		
#140	32		
#200	28		
0.0470 mm.	27		
0.0339 mm.	24		
0.0246 mm.	19		
0.0175 mm.	17		
0.0129 mm.	15		
0.0092 mm.	14		
0.0066 mm.	12		
0.0054 mm.	11		
0.0047 mm.	9.9		
0.0014 mm.	4.9		

* (no specification provided)

Material Description

silty sand

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D₉₀= 5.2429 D₈₅= 3.0333 D₆₀= 0.5475
D₅₀= 0.3450 D₃₀= 0.0903 D₁₅= 0.0131
D₁₀= 0.0047 C_u= 115.77 C_c= 3.15

Remarks

Water Content (ASTM D2216): 12.4%
F.M.=2.13

Date Received: 4/9/19 Date Tested: 4/15/19

Tested By: GMK & RRW

Checked By: Gina Koski

Title: Lab Analyst

ASTM D7928 Hydrometer analyzed upon client request.

Location: FL-SB-13 (0-6)	Date Sampled: 4/2/19
Sample Number: 260406-003	
Northeast Technical Services	Client: Pace Analytical MPLS
Virginia, MN	Project: 19-01567 MPCA Freeway LF 19 SL
	Project No: 10613-2019
	Figure

GRAIN SIZE DISTRIBUTION TEST DATA

4/16/2019

Client: Pace Analytical MPLS

Project: 19-01567 MPCA Freeway LF 19 SL

Project Number: 10613-2019

Location: FL-SB-13 (0-6')

Sample Number: 260406-003

Material Description: silty sand

Sample Date: 4/2/19

Date Received: 4/9/19

PL: NP

LL: NV

USCS Classification: SM

AASHTO Classification: A-2-4(0)

Grain Size Test Method: ASTM D6913/D7928

Testing Remarks: Water Content (ASTM D2216): 12.4%

Tested By: GMK & RRW

Test Date: 4/15/19

Checked By: Gina Koski

Title: Lab Analyst

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
952.40	528.40	3	0.00	0.00	100
		2	0.00	0.00	100
		1.5	0.00	0.00	100
		1	0.00	0.00	100
		.75	0.00	0.00	100
		.375	16.30	0.00	96
		#4	30.30	0.00	89
		#10	33.90	0.00	81
65.00	0.00	#20	10.00	0.00	69
		#40	11.20	0.00	55
		#60	8.90	0.00	43
		#100	5.90	0.00	36
		#140	3.40	0.00	32
		#200	2.80	0.00	28

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 81

Weight of hydrometer sample = 65.0

Automatic temperature correction

Composite correction (fluid density and meniscus height) at 20 deg. C = -5

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.294964 - 0.164 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	27.0	22.0	0.0136	27.0	11.9	0.0470	27.4
2.00	20.0	24.0	19.0	0.0136	24.0	12.4	0.0339	23.6
4.00	20.0	20.0	15.0	0.0136	20.0	13.0	0.0246	18.6
8.00	20.0	19.0	14.0	0.0136	19.0	13.2	0.0175	17.4
15.00	20.0	17.0	12.0	0.0136	17.0	13.5	0.0129	14.9
30.00	20.0	16.0	11.0	0.0136	16.0	13.7	0.0092	13.7
60.00	20.0	15.0	10.0	0.0136	15.0	13.8	0.0066	12.4
90.00	20.0	14.0	9.0	0.0136	14.0	14.0	0.0054	11.2
120.00	20.0	13.0	8.0	0.0136	13.0	14.2	0.0047	9.9
1438.00	20.0	9.0	4.0	0.0136	9.0	14.8	0.0014	4.9

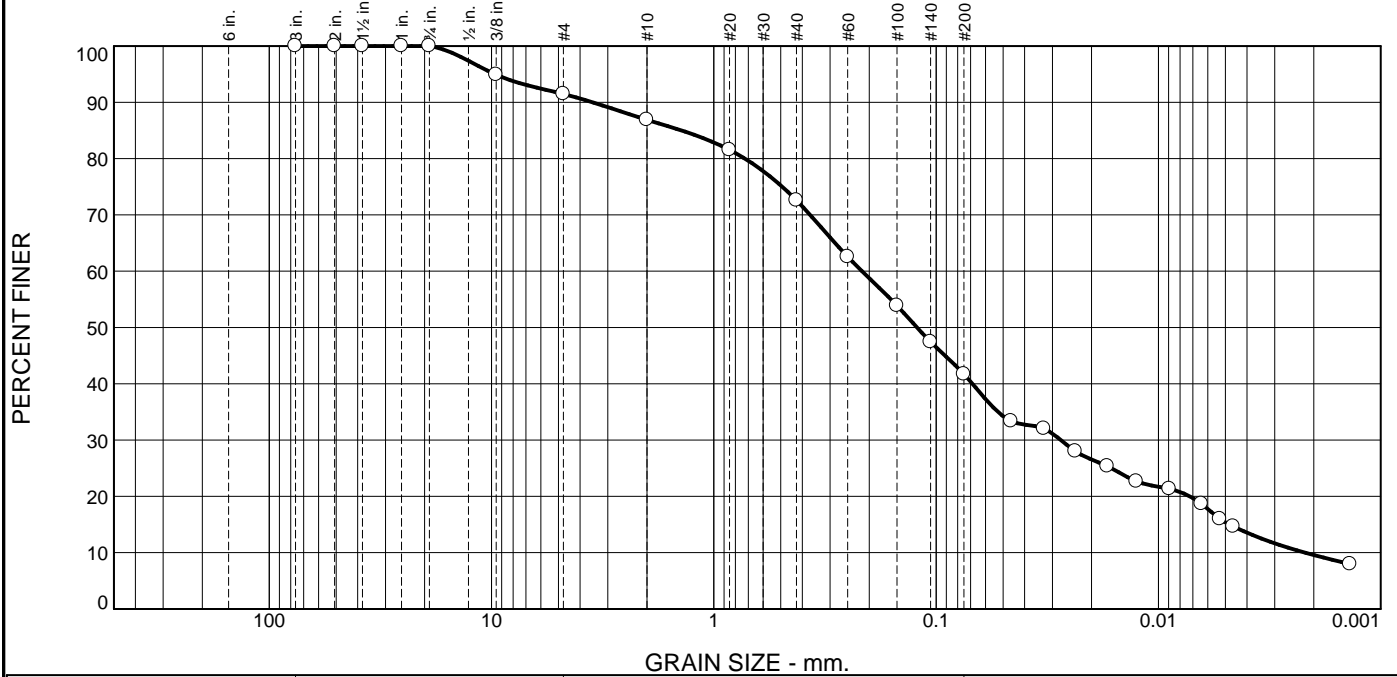
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	11	11	8	26	27	61	17	11	28

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.0014	0.0047	0.0131	0.0274	0.0903	0.2010	0.3450	0.5475	1.8289	3.0333	5.2429	8.4397

Fineness Modulus	C _u	C _c
2.13	115.77	3.15

ASTM D6913 / ASTM D7928



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	9	4	14	31	27	15

TEST RESULTS (ASTM D6913/D7928)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100		
2	100		
1.5	100		
1	100		
.75	100		
.375	95		
#4	91		
#10	87		
#20	82		
#40	73		
#60	63		
#100	54		
#140	47		
#200	42		
0.0460 mm.	33		
0.0328 mm.	32		
0.0237 mm.	28		
0.0170 mm.	25		
0.0125 mm.	23		
0.0089 mm.	21		
0.0064 mm.	19		
0.0053 mm.	16		
0.0046 mm.	15		
0.0014 mm.	8.0		

* (no specification provided)

Material Description

silty sand

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-4(0)

Coefficients

D₉₀= 3.5146 D₈₅= 1.4010 D₆₀= 0.2156
D₅₀= 0.1220 D₃₀= 0.0275 D₁₅= 0.0048
D₁₀= 0.0022 C_u= 98.47 C_c= 1.60

Remarks

Water Content (ASTM D2216): 26.4%
F.M.=1.44

Date Received: 4/9/19 Date Tested: 4/15/19

Tested By: GMK & RRW

Checked By: Gina Koski

Title: Lab Analyst

ASTM D7928 Hydrometer analyzed upon client request.

Location: FL-SB-14 (0-10')
Sample Number: 260406-004

Date Sampled: 4/2/19

Northeast Technical Services

Virginia, MN

Client: Pace Analytical MPLS
Project: 19-01567 MPCA Freeway LF 19 SL

Project No: 10613-2019

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

4/16/2019

Client: Pace Analytical MPLS
Project: 19-01567 MPCA Freeway LF 19 SL
Project Number: 10613-2019
Location: FL-SB-14 (0-10')
Sample Number: 260406-004
Material Description: silty sand
Sample Date: 4/2/19
Date Received: 4/9/19 **PL:** NP **LL:** NV
USCS Classification: SM **AASHTO Classification:** A-4(0)
Grain Size Test Method: ASTM D6913/D7928
Testing Remarks: Water Content (ASTM D2216): 26.4%
Tested By: GMK & RRW **Test Date:** 4/15/19
Checked By: Gina Koski **Title:** Lab Analyst

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
926.40	523.00	3	0.00	0.00	100
		2	0.00	0.00	100
		1.5	0.00	0.00	100
		1	0.00	0.00	100
		.75	0.00	0.00	100
		.375	20.60	0.00	95
		#4	13.80	0.00	91
		#10	18.50	0.00	87
65.00	0.00	#20	4.00	0.00	82
		#40	6.70	0.00	73
		#60	7.50	0.00	63
		#100	6.50	0.00	54
		#140	4.80	0.00	47
		#200	4.30	0.00	42

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 87

Weight of hydrometer sample = 65.0

Automatic temperature correction

Composite correction (fluid density and meniscus height) at 20 deg. C = -5

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.294964 - 0.164 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	30.0	25.0	0.0136	30.0	11.4	0.0460	33.4
2.00	20.0	29.0	24.0	0.0136	29.0	11.5	0.0328	32.0
4.00	20.0	26.0	21.0	0.0136	26.0	12.0	0.0237	28.0
8.00	20.0	24.0	19.0	0.0136	24.0	12.4	0.0170	25.3
15.00	20.0	22.0	17.0	0.0136	22.0	12.7	0.0125	22.7
30.00	20.0	21.0	16.0	0.0136	21.0	12.9	0.0089	21.3
60.00	20.0	19.0	14.0	0.0136	19.0	13.2	0.0064	18.7
90.00	20.0	17.0	12.0	0.0136	17.0	13.5	0.0053	16.0
120.00	20.0	16.0	11.0	0.0136	16.0	13.7	0.0046	14.6
1430.00	20.0	11.0	6.0	0.0136	11.0	14.5	0.0014	8.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0	0	9	9	4	14	31	49	27	15	42

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.0022	0.0048	0.0072	0.0275	0.0687	0.1220	0.2156	0.7256	1.4010	3.5146	9.6592

Fineness Modulus	C _u	C _c
1.44	98.47	1.60

Chain of Custody

260406



Workorder: 10469445

Workorder Name: 19-01567 MPCA Freeway LF 19 SL

Results Requested By: 4/17/2019

Report / Invoice To		Subcontract To				Requested Analysis										LAB USE ONLY										
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436 Email: jennifer.anderson@pacelabs.com		P.O. 10469445 NTS 526 Chestnut St. Virginia, MN 55792				STM D422 Grain Size + Hydrometer																				
State of Sample Origin: MN		Preserved Containers																								
Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Unpreserved ZPLU																					
1	FL-SB-11 (0-20ft)	4/2/2019 16:00	10469445011	Solid	1																					001
2	FL-SB-12 (0-10ft)	4/2/2019 16:40	10469445012	Solid	1																					002
3	FL-SB-13 (0-6ft)	4/2/2019 17:10	10469445013	Solid	1											003										
4	FL-SB-14 (0-10ft)	4/2/2019 17:40	10469445014	Solid	1											004										
5																										

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	4/4/19 12:45	<i>[Signature]</i>	4/4/19 12:30						
<i>[Signature]</i>	4/4/19 15:10	<i>[Signature]</i>	4/4/19 15:10						
<i>[Signature]</i>	4/5/19 9:30	<i>[Signature]</i>	4/5/19 9:00						

Cooler Temperature on Receipt 2.1 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

Kate Rhoads 4/5/19 11:32
Received By: L M... 4/5/19 11:30 2.6°C

A Koska 4-9-19 10:00

May 14, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 Freeway LF Bedrock
Pace Project No.: 10471713

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 22, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas DW Certification #: MN00064
 Arkansas WW Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064
 Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
 Minnesota Petrofund Certification #: 1240
 Mississippi Certification #: MN00064
 Missouri Certification #: 10100
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon Primary Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Vermont Certification #: VT-027053137
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DEP Certification #: 382
 West Virginia DW Certification #: 9952 C
 Wisconsin Certification #: 999407970
 Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Montana Certificate #CERT0103
 Alaska Certification UST-107
 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad
 Florida/TNI Certification #: E87683

Georgia Certification #: C040
 Guam Certification
 Florida: Cert E871149 SEKS WET
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133
 KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268
Illinois Certification #: 200074
Indiana Certification #: C-49-06
Kansas/NELAP Certification #: E-10177
Kentucky UST Certification #: 80226
Kentucky WW Certification #: 98019
Michigan Department of Environmental Quality, Laboratory #9050

Ohio VAP Certification #: CL0065
Oklahoma Certification #: 2018-101
Texas Certification #: T104704355
West Virginia Certification #: 330
Wisconsin Certification #: 999788130
USDA Soil Permit #: P330-16-00257

Charlotte Certification IDs

9800 Kinsey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 Freeway LF Bedrock
Pace Project No.: 10471713

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10471713001	FL-MW-E2 (33-35 ft)	Solid	04/02/19 00:00	04/22/19 14:32
10471713002	FL-MW-D2 (27-29.5 ft)	Solid	04/02/19 00:00	04/22/19 14:32

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10471713001	FL-MW-E2 (33-35 ft)	EPA 8082A	RAG	12	PASI-M
		EPA 6010D	IP	8	PASI-M
		EPA 6020B	BWB	12	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	STB	72	PASI-M
		EPA 8260B	CD2	70	PASI-M
		EPA 8260B Mod.	CL	3	PASI-C
		EPA 9310	NEG	2	PASI-PA
		EPA 7196A	TPD	1	PASI-I
		EPA 350.1	DMB	1	PASI-V
		EPA 9012B	DAW	1	PASI-G
		EPA 9056A	ZJT	1	PASI-V
		10471713002	FL-MW-D2 (27-29.5 ft)	EPA 8082A	RAG
EPA 6010D	IP			8	PASI-M
EPA 6020B	BWB			12	PASI-M
ASTM D2974	JDL			1	PASI-M
EPA 8270D	STB			72	PASI-M
EPA 8260B	CD2			70	PASI-M
EPA 8260B Mod.	CL			3	PASI-C
EPA 9310	NEG			2	PASI-PA
EPA 7196A	TPD			1	PASI-I
EPA 350.1	DMB			1	PASI-V
EPA 9012B	DAW			1	PASI-G
EPA 9056A	ZJT			1	PASI-V

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-E2 (33-35 ft) Lab ID: 10471713001 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA 3550								
PCB-1016 (Aroclor 1016)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	11100-14-4	
PCB, Total	ND	ug/kg	37.0	1	04/24/19 17:28	04/25/19 12:03	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	87	%	57-125	1	04/24/19 17:28	04/25/19 12:03	877-09-8	
Decachlorobiphenyl (S)	90	%	49-125	1	04/24/19 17:28	04/25/19 12:03	2051-24-3	
6010D MET ICP Analytical Method: EPA 6010D Preparation Method: EPA 3050								
Aluminum	1340	mg/kg	53.2	5	04/24/19 06:46	04/25/19 13:02	7429-90-5	
Barium	8.4	mg/kg	2.7	5	04/24/19 06:46	04/25/19 13:02	7440-39-3	
Copper	34.3	mg/kg	2.7	5	04/24/19 06:46	04/25/19 13:02	7440-50-8	
Manganese	998	mg/kg	1.3	5	04/24/19 06:46	04/25/19 13:02	7439-96-5	
Nickel	10.0	mg/kg	5.3	5	04/24/19 06:46	04/25/19 13:02	7440-02-0	
Silver	ND	mg/kg	2.7	5	04/24/19 06:46	04/25/19 13:02	7440-22-4	D3
Tin	ND	mg/kg	20.0	5	04/24/19 06:46	04/25/19 13:02	7440-31-5	D3
Zinc	14.2	mg/kg	5.3	5	04/24/19 06:46	04/25/19 13:02	7440-66-6	
6020B MET ICPMS Analytical Method: EPA 6020B Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.56	20	04/26/19 06:58	05/02/19 11:54	7440-36-0	
Arsenic	3.4	mg/kg	0.56	20	04/26/19 06:58	05/02/19 11:54	7440-38-2	
Beryllium	ND	mg/kg	0.23	20	04/26/19 06:58	05/02/19 11:54	7440-41-7	
Boron	ND	mg/kg	11.3	20	04/26/19 06:58	05/02/19 11:54	7440-42-8	
Cadmium	0.14	mg/kg	0.090	20	04/26/19 06:58	05/02/19 11:54	7440-43-9	
Chromium	8.2	mg/kg	0.56	20	04/26/19 06:58	05/02/19 11:54	7440-47-3	
Cobalt	2.5	mg/kg	0.56	20	04/26/19 06:58	05/02/19 11:54	7440-48-4	
Lead	3.1	mg/kg	0.23	20	04/26/19 06:58	05/02/19 11:54	7439-92-1	
Selenium	ND	mg/kg	0.56	20	04/26/19 06:58	05/02/19 11:54	7782-49-2	
Thallium	0.16	mg/kg	0.11	20	04/26/19 06:58	05/02/19 11:54	7440-28-0	
Uranium-238	0.66	mg/kg	0.56	20	04/26/19 06:58	05/02/19 11:54	7440-61-1	
Vanadium	17.4	mg/kg	1.1	20	04/26/19 06:58	05/02/19 11:54	7440-62-2	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	11.4	%	0.10	1		05/08/19 13:53		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	83-32-9	H3
Acenaphthylene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	208-96-8	H3
Anthracene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	120-12-7	H3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-E2 (33-35 ft) Lab ID: 10471713001 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Benzo(a)anthracene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	56-55-3	H3
Benzo(a)pyrene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	50-32-8	H3
Benzo(b)fluoranthene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	205-99-2	H3
Benzo(g,h,i)perylene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	191-24-2	H3
Benzo(k)fluoranthene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	207-08-9	H3
4-Bromophenylphenyl ether	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	101-55-3	H3
Butylbenzylphthalate	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	85-68-7	H3
Carbazole	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	86-74-8	H3
4-Chloro-3-methylphenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	59-50-7	H3
4-Chloroaniline	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	106-47-8	H3
bis(2-Chloroethoxy)methane	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	111-91-1	H3
bis(2-Chloroethyl) ether	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	111-44-4	H3
bis(2-Chloroisopropyl) ether	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	108-60-1	H3
2-Chloronaphthalene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	91-58-7	H3
2-Chlorophenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	95-57-8	H3
4-Chlorophenylphenyl ether	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	7005-72-3	H3
Chrysene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	218-01-9	H3
Dibenz(a,h)anthracene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	53-70-3	H3
Dibenzofuran	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	132-64-9	H3
1,2-Dichlorobenzene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	95-50-1	H3
1,3-Dichlorobenzene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	541-73-1	H3
1,4-Dichlorobenzene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	106-46-7	H3
3,3'-Dichlorobenzidine	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	91-94-1	H3
2,4-Dichlorophenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	120-83-2	H3
Diethylphthalate	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	84-66-2	H3
2,4-Dimethylphenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	105-67-9	H3
Dimethylphthalate	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	131-11-3	H3
Di-n-butylphthalate	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	84-74-2	H3
4,6-Dinitro-2-methylphenol	ND	ug/kg	1920	1	04/23/19 14:32	04/25/19 13:22	534-52-1	H3
2,4-Dinitrophenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	51-28-5	H3
2,4-Dinitrotoluene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	121-14-2	H3
2,6-Dinitrotoluene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	606-20-2	H3
Di-n-octylphthalate	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	117-84-0	H3
1,2-Diphenylhydrazine	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	122-66-7	H3
bis(2-Ethylhexyl)phthalate	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	117-81-7	H3
Fluoranthene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	206-44-0	H3
Fluorene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	86-73-7	H3
Hexachloro-1,3-butadiene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	87-68-3	H3
Hexachlorobenzene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	118-74-1	H3
Hexachloroethane	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	67-72-1	H3
Indeno(1,2,3-cd)pyrene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	193-39-5	H3
Isophorone	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	78-59-1	H3
1-Methylnaphthalene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	90-12-0	H3
2-Methylnaphthalene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	91-57-6	H3
2-Methylphenol(o-Cresol)	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	95-48-7	H3
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	745	1	04/23/19 14:32	04/25/19 13:22		H3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-E2 (33-35 ft) Lab ID: 10471713001 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
Naphthalene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	91-20-3	H3
2-Nitroaniline	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	88-74-4	H3
3-Nitroaniline	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	99-09-2	H3
4-Nitroaniline	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	100-01-6	H3
Nitrobenzene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	98-95-3	H3
2-Nitrophenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	88-75-5	H3
4-Nitrophenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	100-02-7	H3
N-Nitrosodimethylamine	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	62-75-9	H3
N-Nitroso-di-n-propylamine	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	621-64-7	H3
N-Nitrosodiphenylamine	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	86-30-6	H3
Pentachlorophenol	ND	ug/kg	756	1	04/23/19 14:32	04/25/19 13:22	87-86-5	H3
Phenanthrene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	85-01-8	H3
Phenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	108-95-2	H3
Pyrene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	129-00-0	H3
1,2,4-Trichlorobenzene	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	120-82-1	H3
2,4,5-Trichlorophenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	95-95-4	H3
2,4,6-Trichlorophenol	ND	ug/kg	372	1	04/23/19 14:32	04/25/19 13:22	88-06-2	H3
Surrogates								
Nitrobenzene-d5 (S)	53	%	47-125	1	04/23/19 14:32	04/25/19 13:22	4165-60-0	
2-Fluorobiphenyl (S)	61	%	54-125	1	04/23/19 14:32	04/25/19 13:22	321-60-8	
p-Terphenyl-d14 (S)	76	%	58-125	1	04/23/19 14:32	04/25/19 13:22	1718-51-0	
Phenol-d6 (S)	61	%	48-125	1	04/23/19 14:32	04/25/19 13:22	13127-88-3	
2-Fluorophenol (S)	58	%	41-125	1	04/23/19 14:32	04/25/19 13:22	367-12-4	
2,4,6-Tribromophenol (S)	70	%	30-125	1	04/23/19 14:32	04/25/19 13:22	118-79-6	
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Acetone	ND	ug/kg	1180	1	04/23/19 10:41	04/23/19 18:21	67-64-1	
Allyl chloride	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	107-05-1	
Benzene	ND	ug/kg	23.7	1	04/23/19 10:41	04/23/19 18:21	71-43-2	
Bromobenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	108-86-1	
Bromochloromethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	74-97-5	
Bromodichloromethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	75-27-4	
Bromoform	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	75-25-2	
Bromomethane	ND	ug/kg	591	1	04/23/19 10:41	04/23/19 18:21	74-83-9	
2-Butanone (MEK)	ND	ug/kg	296	1	04/23/19 10:41	04/23/19 18:21	78-93-3	
n-Butylbenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	104-51-8	
sec-Butylbenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	135-98-8	
tert-Butylbenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	98-06-6	
Carbon tetrachloride	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	56-23-5	
Chlorobenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	108-90-7	
Chloroethane	ND	ug/kg	591	1	04/23/19 10:41	04/23/19 18:21	75-00-3	
Chloroform	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	67-66-3	
Chloromethane	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	74-87-3	
2-Chlorotoluene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	95-49-8	
4-Chlorotoluene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	591	1	04/23/19 10:41	04/23/19 18:21	96-12-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-E2 (33-35 ft) Lab ID: 10471713001 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Dibromochloromethane	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	106-93-4	
Dibromomethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	75-71-8	
1,1-Dichloroethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	75-34-3	
1,2-Dichloroethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	107-06-2	
1,1-Dichloroethene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	156-60-5	
Dichlorofluoromethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	75-43-4	N2
1,2-Dichloropropane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	78-87-5	
1,3-Dichloropropane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	142-28-9	
2,2-Dichloropropane	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	594-20-7	
1,1-Dichloropropene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	60-29-7	
Ethylbenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	296	1	04/23/19 10:41	04/23/19 18:21	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	98-82-8	
p-Isopropyltoluene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	99-87-6	
Methylene Chloride	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	296	1	04/23/19 10:41	04/23/19 18:21	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	1634-04-4	
Naphthalene	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	91-20-3	
n-Propylbenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	103-65-1	
Styrene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	79-34-5	
Tetrachloroethene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	127-18-4	
Tetrahydrofuran	ND	ug/kg	2370	1	04/23/19 10:41	04/23/19 18:21	109-99-9	
Toluene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	79-00-5	
Trichloroethene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	79-01-6	
Trichlorofluoromethane	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	237	1	04/23/19 10:41	04/23/19 18:21	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	59.1	1	04/23/19 10:41	04/23/19 18:21	108-67-8	
Vinyl chloride	ND	ug/kg	23.7	1	04/23/19 10:41	04/23/19 18:21	75-01-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Sample Project No.: 10471713

Sample: FL-MW-E2 (33-35 ft) Lab ID: 10471713001 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
Xylene (Total)	ND	ug/kg	177	1	04/23/19 10:41	04/23/19 18:21	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	75-125	1	04/23/19 10:41	04/23/19 18:21	17060-07-0	H3
Toluene-d8 (S)	100	%	75-125	1	04/23/19 10:41	04/23/19 18:21	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125	1	04/23/19 10:41	04/23/19 18:21	460-00-4	
8260 MSV SIM Soil		Analytical Method: EPA 8260B Mod. Preparation Method: EPA 8260B Mod.						
1,4-Dioxane (p-Dioxane)	ND	ug/kg	9.8	1	04/26/19 17:01	04/27/19 19:11	123-91-1	H3
Surrogates								
1,2-Dichloroethane-d4 (S)	86	%	50-150	1	04/26/19 17:01	04/27/19 19:11	17060-07-0	
Toluene-d8 (S)	99	%	50-150	1	04/26/19 17:01	04/27/19 19:11	2037-26-5	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	2.3	1	05/01/19 10:45	05/02/19 09:20	18540-29-9	
350.1 Ammonia		Analytical Method: EPA 350.1 Preparation Method: EPA 350.1						
Nitrogen, Ammonia	30.5	mg/kg	3.4	1	04/25/19 11:42	04/26/19 08:55	7664-41-7	M1
9012 Cyanide, Total		Analytical Method: EPA 9012B Preparation Method: EPA 9012B						
Cyanide	ND	mg/kg	0.41	1	04/29/19 10:30	04/29/19 13:28	57-12-5	H3
9056 IC Anions		Analytical Method: EPA 9056A Preparation Method: EPA 300.0						
Chloride	44.4	mg/kg	10.0	1	04/29/19 14:13	04/29/19 18:48	16887-00-6	

Sample: FL-MW-D2 (27-29.5 ft) Lab ID: 10471713002 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA 3550						
PCB-1016 (Aroclor 1016)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	11100-14-4	
PCB, Total	ND	ug/kg	34.8	1	04/24/19 17:28	04/25/19 12:18	1336-36-3	
Surrogates								
Tetrachloro-m-xylene (S)	84	%	57-125	1	04/24/19 17:28	04/25/19 12:18	877-09-8	
Decachlorobiphenyl (S)	90	%	49-125	1	04/24/19 17:28	04/25/19 12:18	2051-24-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-D2 (27-29.5 ft) Lab ID: 10471713002 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP Analytical Method: EPA 6010D Preparation Method: EPA 3050								
Aluminum	1680	mg/kg	49.3	5	04/24/19 06:46	04/25/19 13:05	7429-90-5	
Barium	12.8	mg/kg	2.5	5	04/24/19 06:46	04/25/19 13:05	7440-39-3	
Copper	18.4	mg/kg	2.5	5	04/24/19 06:46	04/25/19 13:05	7440-50-8	
Manganese	1500	mg/kg	1.2	5	04/24/19 06:46	04/25/19 13:05	7439-96-5	
Nickel	10.6	mg/kg	4.9	5	04/24/19 06:46	04/25/19 13:05	7440-02-0	
Silver	ND	mg/kg	2.5	5	04/24/19 06:46	04/25/19 13:05	7440-22-4	D3
Tin	ND	mg/kg	18.5	5	04/24/19 06:46	04/25/19 13:05	7440-31-5	D3
Zinc	13.4	mg/kg	4.9	5	04/24/19 06:46	04/25/19 13:05	7440-66-6	
6020B MET ICPMS Analytical Method: EPA 6020B Preparation Method: EPA 3050								
Antimony	ND	mg/kg	0.50	20	04/26/19 06:58	05/02/19 12:00	7440-36-0	
Arsenic	2.8	mg/kg	0.50	20	04/26/19 06:58	05/02/19 12:00	7440-38-2	
Beryllium	ND	mg/kg	0.20	20	04/26/19 06:58	05/02/19 12:00	7440-41-7	
Boron	ND	mg/kg	10.0	20	04/26/19 06:58	05/02/19 12:00	7440-42-8	
Cadmium	ND	mg/kg	0.080	20	04/26/19 06:58	05/02/19 12:00	7440-43-9	
Chromium	7.9	mg/kg	0.50	20	04/26/19 06:58	05/02/19 12:00	7440-47-3	
Cobalt	3.7	mg/kg	0.50	20	04/26/19 06:58	05/02/19 12:00	7440-48-4	
Lead	3.0	mg/kg	0.20	20	04/26/19 06:58	05/02/19 12:00	7439-92-1	
Selenium	ND	mg/kg	0.50	20	04/26/19 06:58	05/02/19 12:00	7782-49-2	
Thallium	ND	mg/kg	0.10	20	04/26/19 06:58	05/02/19 12:00	7440-28-0	
Uranium-238	0.66	mg/kg	0.50	20	04/26/19 06:58	05/02/19 12:00	7440-61-1	
Vanadium	16.7	mg/kg	1.0	20	04/26/19 06:58	05/02/19 12:00	7440-62-2	
Dry Weight / %M by ASTM D2974 Analytical Method: ASTM D2974								
Percent Moisture	5.2	%	0.10	1		05/08/19 13:54		
8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3550								
Acenaphthene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	83-32-9	H3
Acenaphthylene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	208-96-8	H3
Anthracene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	120-12-7	H3
Benzo(a)anthracene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	56-55-3	H3
Benzo(a)pyrene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	50-32-8	H3
Benzo(b)fluoranthene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	205-99-2	H3
Benzo(g,h,i)perylene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	191-24-2	H3
Benzo(k)fluoranthene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	207-08-9	H3
4-Bromophenylphenyl ether	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	101-55-3	H3
Butylbenzylphthalate	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	85-68-7	H3
Carbazole	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	86-74-8	H3
4-Chloro-3-methylphenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	59-50-7	H3
4-Chloroaniline	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	106-47-8	H3
bis(2-Chloroethoxy)methane	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	111-91-1	H3
bis(2-Chloroethyl) ether	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	111-44-4	H3
bis(2-Chloroisopropyl) ether	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	108-60-1	H3
2-Chloronaphthalene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	91-58-7	H3
2-Chlorophenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	95-57-8	H3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-D2 (27-29.5 ft) Lab ID: 10471713002 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3550						
4-Chlorophenylphenyl ether	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	7005-72-3	H3
Chrysene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	218-01-9	H3
Dibenz(a,h)anthracene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	53-70-3	H3
Dibenzofuran	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	132-64-9	H3
1,2-Dichlorobenzene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	95-50-1	H3
1,3-Dichlorobenzene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	541-73-1	H3
1,4-Dichlorobenzene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	106-46-7	H3
3,3'-Dichlorobenzidine	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	91-94-1	H3
2,4-Dichlorophenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	120-83-2	H3
Diethylphthalate	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	84-66-2	H3
2,4-Dimethylphenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	105-67-9	H3
Dimethylphthalate	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	131-11-3	H3
Di-n-butylphthalate	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	84-74-2	H3
4,6-Dinitro-2-methylphenol	ND	ug/kg	1790	1	04/23/19 14:32	04/25/19 14:52	534-52-1	H3
2,4-Dinitrophenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	51-28-5	H3
2,4-Dinitrotoluene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	121-14-2	H3
2,6-Dinitrotoluene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	606-20-2	H3
Di-n-octylphthalate	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	117-84-0	H3
1,2-Diphenylhydrazine	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	122-66-7	H3
bis(2-Ethylhexyl)phthalate	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	117-81-7	H3
Fluoranthene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	206-44-0	H3
Fluorene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	86-73-7	H3
Hexachloro-1,3-butadiene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	87-68-3	H3
Hexachlorobenzene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	118-74-1	H3
Hexachloroethane	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	67-72-1	H3
Indeno(1,2,3-cd)pyrene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	193-39-5	H3
Isophorone	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	78-59-1	H3
1-Methylnaphthalene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	90-12-0	H3
2-Methylnaphthalene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	91-57-6	H3
2-Methylphenol(o-Cresol)	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	95-48-7	H3
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	696	1	04/23/19 14:32	04/25/19 14:52		H3
Naphthalene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	91-20-3	H3
2-Nitroaniline	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	88-74-4	H3
3-Nitroaniline	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	99-09-2	H3
4-Nitroaniline	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	100-01-6	H3
Nitrobenzene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	98-95-3	H3
2-Nitrophenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	88-75-5	H3
4-Nitrophenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	100-02-7	H3
N-Nitrosodimethylamine	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	62-75-9	H3
N-Nitroso-di-n-propylamine	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	621-64-7	H3
N-Nitrosodiphenylamine	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	86-30-6	H3
Pentachlorophenol	ND	ug/kg	707	1	04/23/19 14:32	04/25/19 14:52	87-86-5	H3
Phenanthrene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	85-01-8	H3
Phenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	108-95-2	H3
Pyrene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	129-00-0	H3
1,2,4-Trichlorobenzene	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	120-82-1	H3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-D2 (27-29.5 ft) Lab ID: 10471713002 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3550								
2,4,5-Trichlorophenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	95-95-4	H3
2,4,6-Trichlorophenol	ND	ug/kg	348	1	04/23/19 14:32	04/25/19 14:52	88-06-2	H3
Surrogates								
Nitrobenzene-d5 (S)	59	%	47-125	1	04/23/19 14:32	04/25/19 14:52	4165-60-0	
2-Fluorobiphenyl (S)	61	%	54-125	1	04/23/19 14:32	04/25/19 14:52	321-60-8	
p-Terphenyl-d14 (S)	73	%	58-125	1	04/23/19 14:32	04/25/19 14:52	1718-51-0	
Phenol-d6 (S)	60	%	48-125	1	04/23/19 14:32	04/25/19 14:52	13127-88-3	
2-Fluorophenol (S)	60	%	41-125	1	04/23/19 14:32	04/25/19 14:52	367-12-4	
2,4,6-Tribromophenol (S)	70	%	30-125	1	04/23/19 14:32	04/25/19 14:52	118-79-6	
8260B MSV 5030 Med Level								
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B								
Acetone	ND	ug/kg	1120	1	04/23/19 10:41	04/23/19 18:39	67-64-1	
Allyl chloride	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	107-05-1	
Benzene	ND	ug/kg	22.3	1	04/23/19 10:41	04/23/19 18:39	71-43-2	
Bromobenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	108-86-1	
Bromochloromethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	74-97-5	
Bromodichloromethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	75-27-4	
Bromoform	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	75-25-2	
Bromomethane	ND	ug/kg	559	1	04/23/19 10:41	04/23/19 18:39	74-83-9	
2-Butanone (MEK)	ND	ug/kg	279	1	04/23/19 10:41	04/23/19 18:39	78-93-3	
n-Butylbenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	104-51-8	
sec-Butylbenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	135-98-8	
tert-Butylbenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	98-06-6	
Carbon tetrachloride	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	56-23-5	
Chlorobenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	108-90-7	
Chloroethane	ND	ug/kg	559	1	04/23/19 10:41	04/23/19 18:39	75-00-3	
Chloroform	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	67-66-3	
Chloromethane	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	74-87-3	
2-Chlorotoluene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	95-49-8	
4-Chlorotoluene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	559	1	04/23/19 10:41	04/23/19 18:39	96-12-8	
Dibromochloromethane	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	106-93-4	
Dibromomethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	75-71-8	
1,1-Dichloroethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	75-34-3	
1,2-Dichloroethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	107-06-2	
1,1-Dichloroethene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	156-60-5	
Dichlorofluoromethane	ND	ug/kg	559	1	04/23/19 10:41	04/23/19 18:39	75-43-4	N2
1,2-Dichloropropane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	78-87-5	
1,3-Dichloropropane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	142-28-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-D2 (27-29.5 ft) Lab ID: 10471713002 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV 5030 Med Level		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B						
2,2-Dichloropropane	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	594-20-7	
1,1-Dichloropropene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	60-29-7	
Ethylbenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	279	1	04/23/19 10:41	04/23/19 18:39	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	98-82-8	
p-Isopropyltoluene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	99-87-6	
Methylene Chloride	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	279	1	04/23/19 10:41	04/23/19 18:39	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	1634-04-4	
Naphthalene	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	91-20-3	
n-Propylbenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	103-65-1	
Styrene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	79-34-5	
Tetrachloroethene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	127-18-4	
Tetrahydrofuran	ND	ug/kg	2230	1	04/23/19 10:41	04/23/19 18:39	109-99-9	
Toluene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	79-00-5	
Trichloroethene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	79-01-6	
Trichlorofluoromethane	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	223	1	04/23/19 10:41	04/23/19 18:39	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	55.9	1	04/23/19 10:41	04/23/19 18:39	108-67-8	
Vinyl chloride	ND	ug/kg	22.3	1	04/23/19 10:41	04/23/19 18:39	75-01-4	
Xylene (Total)	ND	ug/kg	168	1	04/23/19 10:41	04/23/19 18:39	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	75-125	1	04/23/19 10:41	04/23/19 18:39	17060-07-0	H3
Toluene-d8 (S)	99	%	75-125	1	04/23/19 10:41	04/23/19 18:39	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125	1	04/23/19 10:41	04/23/19 18:39	460-00-4	
8260 MSV SIM Soil		Analytical Method: EPA 8260B Mod. Preparation Method: EPA 8260B Mod.						
1,4-Dioxane (p-Dioxane)	ND	ug/kg	9.4	1	04/26/19 17:01	04/27/19 19:30	123-91-1	H3
Surrogates								
1,2-Dichloroethane-d4 (S)	88	%	50-150	1	04/26/19 17:01	04/27/19 19:30	17060-07-0	
Toluene-d8 (S)	98	%	50-150	1	04/26/19 17:01	04/27/19 19:30	2037-26-5	
7196 Chromium, Hexavalent		Analytical Method: EPA 7196A Preparation Method: EPA 3060A						
Chromium, Hexavalent	ND	mg/kg	2.1	1	05/01/19 10:45	05/02/19 09:20	18540-29-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-D2 (27-29.5 ft) Lab ID: 10471713002 Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia								
Analytical Method: EPA 350.1 Preparation Method: EPA 350.1								
Nitrogen, Ammonia	56.0	mg/kg	3.2	1	04/25/19 11:42	04/26/19 09:05	7664-41-7	
9012 Cyanide, Total								
Analytical Method: EPA 9012B Preparation Method: EPA 9012B								
Cyanide	ND	mg/kg	0.30	1	04/29/19 10:30	04/29/19 13:29	57-12-5	H3
9056 IC Anions								
Analytical Method: EPA 9056A Preparation Method: EPA 300.0								
Chloride	118	mg/kg	10.0	1	04/29/19 14:13	04/29/19 20:33	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 601351 Analysis Method: EPA 6010D
QC Batch Method: EPA 3050 Analysis Description: 6010D Solids
Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 3250161 Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.9	04/25/19 11:12	
Barium	mg/kg	ND	0.50	04/25/19 11:12	
Copper	mg/kg	ND	0.50	04/25/19 11:12	
Manganese	mg/kg	ND	0.25	04/25/19 11:12	
Nickel	mg/kg	ND	0.99	04/25/19 11:12	
Silver	mg/kg	ND	0.50	04/25/19 11:12	
Tin	mg/kg	ND	3.7	04/25/19 11:12	
Zinc	mg/kg	ND	0.99	04/25/19 11:12	

LABORATORY CONTROL SAMPLE: 3250162

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	952	992	104	80-120	
Barium	mg/kg	47.6	51.2	107	80-120	
Copper	mg/kg	47.6	49.8	105	80-120	
Manganese	mg/kg	47.6	52.4	110	80-120	
Nickel	mg/kg	47.6	49.9	105	80-120	
Silver	mg/kg	23.8	24.1	101	80-120	
Tin	mg/kg	47.6	50.8	107	80-120	
Zinc	mg/kg	47.6	48.8	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3250163 3250164

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10471761002 Result	Spike Conc.	Spike Conc.	Result								
Aluminum	mg/kg	2730	1060	1020	5330	5540	246	276	75-125	4	20	M1	
Barium	mg/kg	27.0	53	51	90.2	86.7	119	117	75-125	4	20		
Copper	mg/kg	3.7	53	51	55.9	53.1	98	97	75-125	5	20		
Manganese	mg/kg	247	53	51	327	310	151	125	75-125	5	20	M1	
Nickel	mg/kg	7.1	53	51	57.6	54.3	95	93	75-125	6	20		
Silver	mg/kg	ND	26.5	25.5	24.9	23.6	94	93	75-125	5	20		
Tin	mg/kg	ND	53	51	48.9	46.5	90	89	75-125	5	20		
Zinc	mg/kg	13.5	53	51	68.8	63.3	104	98	75-125	8	20		

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 601940 Analysis Method: EPA 6020B
QC Batch Method: EPA 3050 Analysis Description: 6020B Solids UPD5
Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 3253817 Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.50	05/02/19 11:13	
Arsenic	mg/kg	ND	0.50	05/02/19 11:13	
Beryllium	mg/kg	ND	0.20	05/02/19 11:13	
Boron	mg/kg	ND	10.0	05/02/19 11:13	
Cadmium	mg/kg	ND	0.080	05/02/19 11:13	
Chromium	mg/kg	ND	0.50	05/02/19 11:13	
Cobalt	mg/kg	ND	0.50	05/02/19 11:13	
Lead	mg/kg	ND	0.20	05/02/19 11:13	
Selenium	mg/kg	ND	0.50	05/02/19 11:13	
Thallium	mg/kg	ND	0.10	05/02/19 11:13	
Uranium-238	mg/kg	ND	0.50	05/02/19 11:13	
Vanadium	mg/kg	ND	1.0	05/02/19 11:13	

LABORATORY CONTROL SAMPLE: 3253818

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	49	47.7	97	80-120	
Arsenic	mg/kg	49	48.6	99	80-120	
Beryllium	mg/kg	49	51.7	105	80-120	
Boron	mg/kg	49	51.4	105	80-120	
Cadmium	mg/kg	49	47.5	97	80-120	
Chromium	mg/kg	49	47.0	96	80-120	
Cobalt	mg/kg	49	48.5	99	80-120	
Lead	mg/kg	49	46.6	95	80-120	
Selenium	mg/kg	49	48.9	100	80-120	
Thallium	mg/kg	49	47.4	97	80-120	
Uranium-238	mg/kg	49	52.3	107	80-120	
Vanadium	mg/kg	49	49.3	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3253819 3253820

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10472070001 Result	Spike Conc.	Spike Conc.	Result						
Antimony	mg/kg	<0.60	58.9	59.4	41.9	44.8	71	75	75-125	7	20 M6
Arsenic	mg/kg	4.6	58.9	59.4	63.5	62.9	100	98	75-125	1	20
Beryllium	mg/kg	0.60	58.9	59.4	57.8	58.6	97	97	75-125	1	20
Boron	mg/kg	<12.0	58.9	59.4	57.9	59.3	96	97	75-125	2	20
Cadmium	mg/kg	<0.096	58.9	59.4	54.8	55.4	93	93	75-125	1	20

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Parameter	Units	3253819		3253820		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10472070001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Chromium	mg/kg	10.5	58.9	59.4	71.2	68.7	103	98	75-125	4	20	
Cobalt	mg/kg	8.0	58.9	59.4	66.7	65.9	100	97	75-125	1	20	
Lead	mg/kg	6.7	58.9	59.4	60.8	63.8	92	96	75-125	5	20	
Selenium	mg/kg	<0.60	58.9	59.4	52.5	55.3	89	93	75-125	5	20	
Thallium	mg/kg	0.14	58.9	59.4	56.6	58.3	96	98	75-125	3	20	
Uranium-238	mg/kg	<0.60	58.9	59.4	61.8	62.5	104	104	75-125	1	20	
Vanadium	mg/kg	21.1	58.9	59.4	87.8	86.2	113	109	75-125	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 604542

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10471713001, 10471713002

SAMPLE DUPLICATE: 3268247

Parameter	Units	10472477010 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	25.0	19.6	24	30	

SAMPLE DUPLICATE: 3268248

Parameter	Units	10473242033 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	23.7	22.8	4	30	

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 601121

Analysis Method: EPA 8260B

QC Batch Method: EPA 5035/5030B

Analysis Description: 8260B MSV 5030 Med Level

Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 3248996

Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	50.0	04/23/19 17:09	
1,1,1-Trichloroethane	ug/kg	ND	50.0	04/23/19 17:09	
1,1,2,2-Tetrachloroethane	ug/kg	ND	50.0	04/23/19 17:09	
1,1,2-Trichloroethane	ug/kg	ND	50.0	04/23/19 17:09	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	200	04/23/19 17:09	
1,1-Dichloroethane	ug/kg	ND	50.0	04/23/19 17:09	
1,1-Dichloroethene	ug/kg	ND	50.0	04/23/19 17:09	
1,1-Dichloropropene	ug/kg	ND	50.0	04/23/19 17:09	
1,2,3-Trichlorobenzene	ug/kg	ND	50.0	04/23/19 17:09	
1,2,3-Trichloropropane	ug/kg	ND	200	04/23/19 17:09	
1,2,4-Trichlorobenzene	ug/kg	ND	50.0	04/23/19 17:09	
1,2,4-Trimethylbenzene	ug/kg	ND	50.0	04/23/19 17:09	
1,2-Dibromo-3-chloropropane	ug/kg	ND	500	04/23/19 17:09	
1,2-Dibromoethane (EDB)	ug/kg	ND	50.0	04/23/19 17:09	
1,2-Dichlorobenzene	ug/kg	ND	50.0	04/23/19 17:09	
1,2-Dichloroethane	ug/kg	ND	50.0	04/23/19 17:09	
1,2-Dichloropropane	ug/kg	ND	50.0	04/23/19 17:09	
1,3,5-Trimethylbenzene	ug/kg	ND	50.0	04/23/19 17:09	
1,3-Dichlorobenzene	ug/kg	ND	50.0	04/23/19 17:09	
1,3-Dichloropropane	ug/kg	ND	50.0	04/23/19 17:09	
1,4-Dichlorobenzene	ug/kg	ND	50.0	04/23/19 17:09	
2,2-Dichloropropane	ug/kg	ND	200	04/23/19 17:09	
2-Butanone (MEK)	ug/kg	ND	250	04/23/19 17:09	
2-Chlorotoluene	ug/kg	ND	50.0	04/23/19 17:09	
4-Chlorotoluene	ug/kg	ND	50.0	04/23/19 17:09	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	250	04/23/19 17:09	
Acetone	ug/kg	ND	1000	04/23/19 17:09	
Allyl chloride	ug/kg	ND	200	04/23/19 17:09	
Benzene	ug/kg	ND	20.0	04/23/19 17:09	
Bromobenzene	ug/kg	ND	50.0	04/23/19 17:09	
Bromochloromethane	ug/kg	ND	50.0	04/23/19 17:09	
Bromodichloromethane	ug/kg	ND	50.0	04/23/19 17:09	
Bromoform	ug/kg	ND	200	04/23/19 17:09	
Bromomethane	ug/kg	ND	500	04/23/19 17:09	
Carbon tetrachloride	ug/kg	ND	50.0	04/23/19 17:09	
Chlorobenzene	ug/kg	ND	50.0	04/23/19 17:09	
Chloroethane	ug/kg	ND	500	04/23/19 17:09	
Chloroform	ug/kg	ND	50.0	04/23/19 17:09	
Chloromethane	ug/kg	ND	200	04/23/19 17:09	
cis-1,2-Dichloroethene	ug/kg	ND	50.0	04/23/19 17:09	
cis-1,3-Dichloropropene	ug/kg	ND	50.0	04/23/19 17:09	

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

METHOD BLANK: 3248996

Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/kg	ND	200	04/23/19 17:09	
Dibromomethane	ug/kg	ND	50.0	04/23/19 17:09	
Dichlorodifluoromethane	ug/kg	ND	200	04/23/19 17:09	
Dichlorofluoromethane	ug/kg	ND	500	04/23/19 17:09	N2
Diethyl ether (Ethyl ether)	ug/kg	ND	200	04/23/19 17:09	
Ethylbenzene	ug/kg	ND	50.0	04/23/19 17:09	
Hexachloro-1,3-butadiene	ug/kg	ND	250	04/23/19 17:09	
Isopropylbenzene (Cumene)	ug/kg	ND	50.0	04/23/19 17:09	
Methyl-tert-butyl ether	ug/kg	ND	50.0	04/23/19 17:09	
Methylene Chloride	ug/kg	ND	200	04/23/19 17:09	
n-Butylbenzene	ug/kg	ND	50.0	04/23/19 17:09	
n-Propylbenzene	ug/kg	ND	50.0	04/23/19 17:09	
Naphthalene	ug/kg	ND	200	04/23/19 17:09	
p-Isopropyltoluene	ug/kg	ND	50.0	04/23/19 17:09	
sec-Butylbenzene	ug/kg	ND	50.0	04/23/19 17:09	
Styrene	ug/kg	ND	50.0	04/23/19 17:09	
tert-Butylbenzene	ug/kg	ND	50.0	04/23/19 17:09	
Tetrachloroethene	ug/kg	ND	50.0	04/23/19 17:09	
Tetrahydrofuran	ug/kg	ND	2000	04/23/19 17:09	
Toluene	ug/kg	ND	50.0	04/23/19 17:09	
trans-1,2-Dichloroethene	ug/kg	ND	50.0	04/23/19 17:09	
trans-1,3-Dichloropropene	ug/kg	ND	50.0	04/23/19 17:09	
Trichloroethene	ug/kg	ND	50.0	04/23/19 17:09	
Trichlorofluoromethane	ug/kg	ND	200	04/23/19 17:09	
Vinyl chloride	ug/kg	ND	20.0	04/23/19 17:09	
Xylene (Total)	ug/kg	ND	150	04/23/19 17:09	
1,2-Dichloroethane-d4 (S)	%	99	75-125	04/23/19 17:09	
4-Bromofluorobenzene (S)	%	101	75-125	04/23/19 17:09	
Toluene-d8 (S)	%	101	75-125	04/23/19 17:09	

LABORATORY CONTROL SAMPLE: 3248997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	1000	951	95	53-125	
1,1,1-Trichloroethane	ug/kg	1000	871	87	53-146	
1,1,2,2-Tetrachloroethane	ug/kg	1000	920	92	51-125	
1,1,2-Trichloroethane	ug/kg	1000	875	88	55-125	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	802	80	49-150	
1,1-Dichloroethane	ug/kg	1000	759	76	56-125	
1,1-Dichloroethene	ug/kg	1000	719	72	48-148	
1,1-Dichloropropene	ug/kg	1000	774	77	55-142	
1,2,3-Trichlorobenzene	ug/kg	1000	881	88	47-125	
1,2,3-Trichloropropane	ug/kg	1000	910	91	52-125	
1,2,4-Trichlorobenzene	ug/kg	1000	843	84	48-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

LABORATORY CONTROL SAMPLE: 3248997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/kg	1000	890	89	51-126	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2360	94	50-125	
1,2-Dibromoethane (EDB)	ug/kg	1000	900	90	52-125	
1,2-Dichlorobenzene	ug/kg	1000	850	85	50-125	
1,2-Dichloroethane	ug/kg	1000	781	78	51-125	
1,2-Dichloropropane	ug/kg	1000	809	81	57-125	
1,3,5-Trimethylbenzene	ug/kg	1000	870	87	52-127	
1,3-Dichlorobenzene	ug/kg	1000	836	84	50-128	
1,3-Dichloropropane	ug/kg	1000	888	89	55-125	
1,4-Dichlorobenzene	ug/kg	1000	765	76	51-125	
2,2-Dichloropropane	ug/kg	1000	776	78	41-136	
2-Butanone (MEK)	ug/kg	5000	3910	78	43-125	
2-Chlorotoluene	ug/kg	1000	841	84	52-126	
4-Chlorotoluene	ug/kg	1000	854	85	53-126	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4830	97	39-125	
Acetone	ug/kg	5000	4580	92	46-136	
Allyl chloride	ug/kg	1000	712	71	48-130	
Benzene	ug/kg	1000	739	74	48-125	
Bromobenzene	ug/kg	1000	806	81	51-125	
Bromochloromethane	ug/kg	1000	802	80	52-125	
Bromodichloromethane	ug/kg	1000	861	86	51-131	
Bromoform	ug/kg	1000	938	94	52-125	
Bromomethane	ug/kg	1000	824	82	30-150	
Carbon tetrachloride	ug/kg	1000	808	81	59-129	
Chlorobenzene	ug/kg	1000	814	81	54-125	
Chloroethane	ug/kg	1000	814	81	61-132	
Chloroform	ug/kg	1000	872	87	52-125	
Chloromethane	ug/kg	1000	690	69	46-125	
cis-1,2-Dichloroethene	ug/kg	1000	780	78	54-127	
cis-1,3-Dichloropropene	ug/kg	1000	873	87	50-134	
Dibromochloromethane	ug/kg	1000	984	98	54-125	
Dibromomethane	ug/kg	1000	816	82	51-125	
Dichlorodifluoromethane	ug/kg	1000	612	61	42-125	
Dichlorofluoromethane	ug/kg	1000	895	89	30-150 N2	
Diethyl ether (Ethyl ether)	ug/kg	1000	763	76	50-127	
Ethylbenzene	ug/kg	1000	769	77	51-125	
Hexachloro-1,3-butadiene	ug/kg	1000	791	79	41-133	
Isopropylbenzene (Cumene)	ug/kg	1000	886	89	54-134	
Methyl-tert-butyl ether	ug/kg	1000	885	88	53-125	
Methylene Chloride	ug/kg	1000	734	73	48-125	
n-Butylbenzene	ug/kg	1000	853	85	49-135	
n-Propylbenzene	ug/kg	1000	851	85	55-129	
Naphthalene	ug/kg	1000	933	93	51-125	
p-Isopropyltoluene	ug/kg	1000	893	89	53-134	
sec-Butylbenzene	ug/kg	1000	907	91	52-134	
Styrene	ug/kg	1000	928	93	53-128	
tert-Butylbenzene	ug/kg	1000	907	91	51-133	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

LABORATORY CONTROL SAMPLE: 3248997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tetrachloroethane	ug/kg	1000	779	78	54-131	
Tetrahydrofuran	ug/kg	10000	9680	97	42-145	
Toluene	ug/kg	1000	745	75	51-125	
trans-1,2-Dichloroethene	ug/kg	1000	711	71	50-130	
trans-1,3-Dichloropropene	ug/kg	1000	900	90	52-125	
Trichloroethene	ug/kg	1000	797	80	55-131	
Trichlorofluoromethane	ug/kg	1000	893	89	30-150	
Vinyl chloride	ug/kg	1000	735	74	58-125	
Xylene (Total)	ug/kg	3000	2480	83	52-125	
1,2-Dichloroethane-d4 (S)	%			92	75-125	
4-Bromofluorobenzene (S)	%			98	75-125	
Toluene-d8 (S)	%			100	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3248998 3248999

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10471549013 Result	Spike Conc.	Spike Conc.	MS Result							
1,1,1,2-Tetrachloroethane	ug/kg	ND	1170	1050	1160	1380	99	132	68-150	17	30	
1,1,1-Trichloroethane	ug/kg	ND	1170	1050	1080	1310	92	125	63-150	20	30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1170	1050	1010	1330	86	127	60-146	27	30	
1,1,2-Trichloroethane	ug/kg	ND	1170	1050	1110	1280	95	123	63-143	14	30	
1,1,2-Trichloroethane	ug/kg	ND	1170	1050	916	1200	78	115	30-150	27	30	
Trichlorotrifluoroethane												
1,1-Dichloroethane	ug/kg	ND	1170	1050	916	1170	78	112	63-144	24	30	
1,1-Dichloroethene	ug/kg	ND	1170	1050	849	1240	73	119	30-150	38	30	R1
1,1-Dichloropropene	ug/kg	ND	1170	1050	935	1300	80	125	54-150	33	30	R1
1,2,3-Trichlorobenzene	ug/kg	ND	1170	1050	1080	1270	92	121	63-142	16	30	
1,2,3-Trichloropropane	ug/kg	ND	1170	1050	1160	1350	99	129	59-147	15	30	
1,2,4-Trichlorobenzene	ug/kg	ND	1170	1050	1040	1280	90	122	66-142	20	30	
1,2,4-Trimethylbenzene	ug/kg	ND	1170	1050	1100	1410	94	135	65-145	25	30	
1,2-Dibromo-3-chloropropane	ug/kg	ND	2910	2620	2940	3290	101	126	60-142	11	30	
1,2-Dibromoethane (EDB)	ug/kg	ND	1170	1050	1110	1370	95	131	67-135	21	30	
1,2-Dichlorobenzene	ug/kg	ND	1170	1050	1070	1290	92	123	68-141	18	30	
1,2-Dichloroethane	ug/kg	ND	1170	1050	978	1190	84	113	56-132	19	30	
1,2-Dichloropropane	ug/kg	ND	1170	1050	1020	1280	88	122	58-150	22	30	
1,3,5-Trimethylbenzene	ug/kg	ND	1170	1050	1080	1380	92	132	66-148	24	30	
1,3-Dichlorobenzene	ug/kg	ND	1170	1050	1030	1280	89	123	63-148	22	30	
1,3-Dichloropropane	ug/kg	ND	1170	1050	1120	1300	96	124	63-142	15	30	
1,4-Dichlorobenzene	ug/kg	ND	1170	1050	953	1170	82	112	68-140	21	30	
2,2-Dichloropropane	ug/kg	ND	1170	1050	955	1190	82	114	62-143	22	30	
2-Butanone (MEK)	ug/kg	ND	5840	5230	6130	6510	105	124	53-138	6	30	
2-Chlorotoluene	ug/kg	ND	1170	1050	1040	1320	89	126	64-145	23	30	
4-Chlorotoluene	ug/kg	ND	1170	1050	1050	1350	90	129	63-149	25	30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5840	5230	6160	6890	106	132	47-150	11	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3248998 3248999												
Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10471549013 Result	Spike Conc.	Spike Conc.	MS Result							
Acetone	ug/kg	ND	5840	5230	7540	8590	129	164	64-150	13	30	M1
Allyl chloride	ug/kg	ND	1170	1050	840	1130	72	108	49-146	29	30	
Benzene	ug/kg	ND	1170	1050	946	1200	81	114	63-136	23	30	
Bromobenzene	ug/kg	ND	1170	1050	1000	1250	86	119	63-142	22	30	
Bromochloromethane	ug/kg	ND	1170	1050	1030	1270	89	121	61-139	20	30	
Bromodichloromethane	ug/kg	ND	1170	1050	1060	1270	91	121	63-150	18	30	
Bromoform	ug/kg	ND	1170	1050	1210	1350	104	129	64-140	11	30	
Bromomethane	ug/kg	ND	1170	1050	980	1080	84	103	56-148	10	30	
Carbon tetrachloride	ug/kg	ND	1170	1050	984	1280	84	123	75-148	27	30	
Chlorobenzene	ug/kg	ND	1170	1050	1040	1290	89	123	62-147	21	30	
Chloroethane	ug/kg	ND	1170	1050	979	1050	84	100	37-150	7	30	
Chloroform	ug/kg	ND	1170	1050	1080	1300	93	124	66-130	18	30	
Chloromethane	ug/kg	ND	1170	1050	812	841	70	80	35-131	3	30	
cis-1,2-Dichloroethene	ug/kg	ND	1170	1050	1020	1230	87	118	63-143	19	30	
cis-1,3-Dichloropropene	ug/kg	ND	1170	1050	1100	1310	95	125	60-150	17	30	
Dibromochloromethane	ug/kg	ND	1170	1050	1250	1390	107	133	64-144	11	30	
Dibromomethane	ug/kg	ND	1170	1050	1060	1320	91	126	59-148	22	30	
Dichlorodifluoromethane	ug/kg	ND	1170	1050	598	644	51	61	30-125	7	30	
Dichlorofluoromethane	ug/kg	ND	1170	1050	1080	1180	93	113	39-150	9	30	N2
Diethyl ether (Ethyl ether)	ug/kg	ND	1170	1050	928	1160	80	111	59-149	22	30	
Ethylbenzene	ug/kg	ND	1170	1050	992	1250	85	119	64-142	23	30	
Hexachloro-1,3-butadiene	ug/kg	ND	1170	1050	1010	1270	87	121	58-150	23	30	
Isopropylbenzene (Cumene)	ug/kg	ND	1170	1050	1100	1410	95	135	67-150	24	30	
Methyl-tert-butyl ether	ug/kg	ND	1170	1050	1090	1280	93	122	69-134	16	30	
Methylene Chloride	ug/kg	ND	1170	1050	936	1180	78	111	56-134	23	30	
n-Butylbenzene	ug/kg	ND	1170	1050	1040	1340	89	128	64-150	25	30	
n-Propylbenzene	ug/kg	ND	1170	1050	1030	1340	88	128	65-150	26	30	
Naphthalene	ug/kg	ND	1170	1050	1180	1400	101	133	63-148	17	30	
p-Isopropyltoluene	ug/kg	ND	1170	1050	1140	1430	97	136	69-150	23	30	
sec-Butylbenzene	ug/kg	ND	1170	1050	1110	1410	95	134	69-150	24	30	
Styrene	ug/kg	ND	1170	1050	1170	1450	101	138	63-150	21	30	
tert-Butylbenzene	ug/kg	ND	1170	1050	1130	1380	97	132	67-150	20	30	
Tetrachloroethene	ug/kg	ND	1170	1050	964	1340	83	128	62-150	33	30	R1
Tetrahydrofuran	ug/kg	ND	11700	10500	12200	15400	105	147	53-150	23	30	
Toluene	ug/kg	ND	1170	1050	925	1230	79	117	61-141	28	30	
trans-1,2-Dichloroethene	ug/kg	ND	1170	1050	900	1250	77	120	52-148	33	30	R1
trans-1,3-Dichloropropene	ug/kg	ND	1170	1050	1130	1350	97	129	62-142	18	30	
Trichloroethene	ug/kg	ND	1170	1050	1100	1300	94	124	59-150	16	30	
Trichlorofluoromethane	ug/kg	ND	1170	1050	989	1090	85	104	30-150	10	30	
Vinyl chloride	ug/kg	ND	1170	1050	846	894	73	85	44-144	5	30	
Xylene (Total)	ug/kg	ND	3500	3140	3120	4030	89	128	67-145	26	30	
1,2-Dichloroethane-d4 (S)	%						96	91	75-125			
4-Bromofluorobenzene (S)	%						100	100	75-125			
Toluene-d8 (S)	%						99	99	75-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 471790 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV Soil SIM
Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 2560011 Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/kg	ND	10.0	04/27/19 13:57	
1,2-Dichloroethane-d4 (S)	%	97	50-150	04/27/19 13:57	
Toluene-d8 (S)	%	102	50-150	04/27/19 13:57	

LABORATORY CONTROL SAMPLE: 2560012

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/kg	40	45.5	114	50-150	
1,2-Dichloroethane-d4 (S)	%			98	50-150	
Toluene-d8 (S)	%			101	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2560013 2560014

Parameter	Units	10471713002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dioxane (p-Dioxane)	ug/kg	ND	40.8	40	47.5	40.2	109	93	50-150	17	30	H3
1,2-Dichloroethane-d4 (S)	%						93	99	50-150		30	
Toluene-d8 (S)	%						101	100	50-150		30	

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock
Pace Project No.: 10471713

QC Batch: 601500 Analysis Method: EPA 8082A
QC Batch Method: EPA 3550 Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 3250697 Matrix: Solid
Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.0	04/25/19 08:22	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.0	04/25/19 08:22	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.0	04/25/19 08:22	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.0	04/25/19 08:22	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.0	04/25/19 08:22	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.0	04/25/19 08:22	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.0	04/25/19 08:22	
PCB-1262 (Aroclor 1262)	ug/kg	ND	33.0	04/25/19 08:22	
PCB-1268 (Aroclor 1268)	ug/kg	ND	33.0	04/25/19 08:22	
Decachlorobiphenyl (S)	%	94	49-125	04/25/19 08:22	
Tetrachloro-m-xylene (S)	%	86	57-125	04/25/19 08:22	

LABORATORY CONTROL SAMPLE: 3250698

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	667	564	85	69-125	
PCB-1260 (Aroclor 1260)	ug/kg	667	578	87	63-125	
Decachlorobiphenyl (S)	%			96	49-125	
Tetrachloro-m-xylene (S)	%			91	57-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3250699 3250700

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10471549017 Result	Spike Conc.	Spike Conc.	Result							Result
PCB-1016 (Aroclor 1016)	ug/kg	ND	702	701	593	597	84	85	56-125	1	30	
PCB-1260 (Aroclor 1260)	ug/kg	ND	702	701	609	614	87	88	45-125	1	30	
Decachlorobiphenyl (S)	%						94	92	49-125			
Tetrachloro-m-xylene (S)	%						89	84	57-125			

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 601210

Analysis Method: EPA 8270D

QC Batch Method: EPA 3550

Analysis Description: 8270D Solid MSSV

Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 3249286

Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	330	04/25/19 10:54	
1,2-Dichlorobenzene	ug/kg	ND	330	04/25/19 10:54	
1,2-Diphenylhydrazine	ug/kg	ND	330	04/25/19 10:54	
1,3-Dichlorobenzene	ug/kg	ND	330	04/25/19 10:54	
1,4-Dichlorobenzene	ug/kg	ND	330	04/25/19 10:54	
1-Methylnaphthalene	ug/kg	ND	330	04/25/19 10:54	
2,4,5-Trichlorophenol	ug/kg	ND	330	04/25/19 10:54	
2,4,6-Trichlorophenol	ug/kg	ND	330	04/25/19 10:54	
2,4-Dichlorophenol	ug/kg	ND	330	04/25/19 10:54	
2,4-Dimethylphenol	ug/kg	ND	330	04/25/19 10:54	
2,4-Dinitrophenol	ug/kg	ND	330	04/25/19 10:54	
2,4-Dinitrotoluene	ug/kg	ND	330	04/25/19 10:54	
2,6-Dinitrotoluene	ug/kg	ND	330	04/25/19 10:54	
2-Chloronaphthalene	ug/kg	ND	330	04/25/19 10:54	
2-Chlorophenol	ug/kg	ND	330	04/25/19 10:54	
2-Methylnaphthalene	ug/kg	ND	330	04/25/19 10:54	
2-Methylphenol(o-Cresol)	ug/kg	ND	330	04/25/19 10:54	
2-Nitroaniline	ug/kg	ND	330	04/25/19 10:54	
2-Nitrophenol	ug/kg	ND	330	04/25/19 10:54	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	660	04/25/19 10:54	
3,3'-Dichlorobenzidine	ug/kg	ND	330	04/25/19 10:54	
3-Nitroaniline	ug/kg	ND	330	04/25/19 10:54	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1700	04/25/19 10:54	
4-Bromophenylphenyl ether	ug/kg	ND	330	04/25/19 10:54	
4-Chloro-3-methylphenol	ug/kg	ND	330	04/25/19 10:54	
4-Chloroaniline	ug/kg	ND	330	04/25/19 10:54	
4-Chlorophenylphenyl ether	ug/kg	ND	330	04/25/19 10:54	
4-Nitroaniline	ug/kg	ND	330	04/25/19 10:54	
4-Nitrophenol	ug/kg	ND	330	04/25/19 10:54	
Acenaphthene	ug/kg	ND	330	04/25/19 10:54	
Acenaphthylene	ug/kg	ND	330	04/25/19 10:54	
Anthracene	ug/kg	ND	330	04/25/19 10:54	
Benzo(a)anthracene	ug/kg	ND	330	04/25/19 10:54	
Benzo(a)pyrene	ug/kg	ND	330	04/25/19 10:54	
Benzo(b)fluoranthene	ug/kg	ND	330	04/25/19 10:54	
Benzo(g,h,i)perylene	ug/kg	ND	330	04/25/19 10:54	
Benzo(k)fluoranthene	ug/kg	ND	330	04/25/19 10:54	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	04/25/19 10:54	
bis(2-Chloroethyl) ether	ug/kg	ND	330	04/25/19 10:54	
bis(2-Chloroisopropyl) ether	ug/kg	ND	330	04/25/19 10:54	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	330	04/25/19 10:54	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

METHOD BLANK: 3249286

Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	ND	330	04/25/19 10:54	
Carbazole	ug/kg	ND	330	04/25/19 10:54	
Chrysene	ug/kg	ND	330	04/25/19 10:54	
Di-n-butylphthalate	ug/kg	ND	330	04/25/19 10:54	
Di-n-octylphthalate	ug/kg	ND	330	04/25/19 10:54	
Dibenz(a,h)anthracene	ug/kg	ND	330	04/25/19 10:54	
Dibenzofuran	ug/kg	ND	330	04/25/19 10:54	
Diethylphthalate	ug/kg	ND	330	04/25/19 10:54	
Dimethylphthalate	ug/kg	ND	330	04/25/19 10:54	
Fluoranthene	ug/kg	ND	330	04/25/19 10:54	
Fluorene	ug/kg	ND	330	04/25/19 10:54	
Hexachloro-1,3-butadiene	ug/kg	ND	330	04/25/19 10:54	
Hexachlorobenzene	ug/kg	ND	330	04/25/19 10:54	
Hexachloroethane	ug/kg	ND	330	04/25/19 10:54	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	04/25/19 10:54	
Isophorone	ug/kg	ND	330	04/25/19 10:54	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	04/25/19 10:54	
N-Nitrosodimethylamine	ug/kg	ND	330	04/25/19 10:54	
N-Nitrosodiphenylamine	ug/kg	ND	330	04/25/19 10:54	
Naphthalene	ug/kg	ND	330	04/25/19 10:54	
Nitrobenzene	ug/kg	ND	330	04/25/19 10:54	
Pentachlorophenol	ug/kg	ND	670	04/25/19 10:54	
Phenanthrene	ug/kg	ND	330	04/25/19 10:54	
Phenol	ug/kg	ND	330	04/25/19 10:54	
Pyrene	ug/kg	ND	330	04/25/19 10:54	
2,4,6-Tribromophenol (S)	%	70	30-125	04/25/19 10:54	
2-Fluorobiphenyl (S)	%	68	54-125	04/25/19 10:54	
2-Fluorophenol (S)	%	60	41-125	04/25/19 10:54	
Nitrobenzene-d5 (S)	%	63	47-125	04/25/19 10:54	
p-Terphenyl-d14 (S)	%	80	58-125	04/25/19 10:54	
Phenol-d6 (S)	%	62	48-125	04/25/19 10:54	

LABORATORY CONTROL SAMPLE: 3249287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1240	75	43-125	
1,2-Dichlorobenzene	ug/kg	1670	1210	73	41-125	
1,2-Diphenylhydrazine	ug/kg	1670	1380	83	59-125	
1,3-Dichlorobenzene	ug/kg	1670	1200	72	40-125	
1,4-Dichlorobenzene	ug/kg	1670	1220	73	40-125	
1-Methylnaphthalene	ug/kg	1670	1270	76	53-125	
2,4,5-Trichlorophenol	ug/kg	1670	1350	81	61-125	
2,4,6-Trichlorophenol	ug/kg	1670	1380	83	60-125	
2,4-Dichlorophenol	ug/kg	1670	1300	78	49-125	

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

LABORATORY CONTROL SAMPLE: 3249287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1240	74	30-125	
2,4-Dinitrophenol	ug/kg	1670	1030	62	30-125	
2,4-Dinitrotoluene	ug/kg	1670	1420	85	62-125	
2,6-Dinitrotoluene	ug/kg	1670	1390	83	61-125	
2-Chloronaphthalene	ug/kg	1670	1300	78	56-125	
2-Chlorophenol	ug/kg	1670	1230	74	42-125	
2-Methylnaphthalene	ug/kg	1670	1280	77	48-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1270	76	44-125	
2-Nitroaniline	ug/kg	1670	1380	83	60-125	
2-Nitrophenol	ug/kg	1670	1240	74	45-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1250	75	47-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1240	75	34-125	
3-Nitroaniline	ug/kg	1670	1230	74	48-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1200J	72	44-125	
4-Bromophenylphenyl ether	ug/kg	1670	1390	83	59-125	
4-Chloro-3-methylphenol	ug/kg	1670	1370	82	58-125	
4-Chloroaniline	ug/kg	1670	991	59	31-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1380	83	61-125	
4-Nitroaniline	ug/kg	1670	1340	80	54-125	
4-Nitrophenol	ug/kg	1670	1390	83	53-125	
Acenaphthene	ug/kg	1670	1360	82	58-125	
Acenaphthylene	ug/kg	1670	1370	82	56-125	
Anthracene	ug/kg	1670	1440	87	59-125	
Benzo(a)anthracene	ug/kg	1670	1330	80	63-125	
Benzo(a)pyrene	ug/kg	1670	1400	84	65-125	
Benzo(b)fluoranthene	ug/kg	1670	1470	88	66-125	
Benzo(g,h,i)perylene	ug/kg	1670	1400	84	65-125	
Benzo(k)fluoranthene	ug/kg	1670	1390	84	64-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1280	77	46-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1210	73	40-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1210	73	35-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1410	85	63-125	
Butylbenzylphthalate	ug/kg	1670	1390	84	65-125	
Carbazole	ug/kg	1670	1430	86	61-125	
Chrysene	ug/kg	1670	1400	84	64-125	
Di-n-butylphthalate	ug/kg	1670	1460	88	64-125	
Di-n-octylphthalate	ug/kg	1670	1420	85	62-125	
Dibenz(a,h)anthracene	ug/kg	1670	1410	84	61-125	
Dibenzofuran	ug/kg	1670	1370	82	60-125	
Diethylphthalate	ug/kg	1670	1410	85	62-125	
Dimethylphthalate	ug/kg	1670	1380	83	62-125	
Fluoranthene	ug/kg	1670	1440	87	60-125	
Fluorene	ug/kg	1670	1400	84	62-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1250	75	39-125	
Hexachlorobenzene	ug/kg	1670	1390	83	61-125	
Hexachloroethane	ug/kg	1670	1180	71	39-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1390	84	62-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

LABORATORY CONTROL SAMPLE: 3249287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1290	78	49-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1220	73	48-125	
N-Nitrosodimethylamine	ug/kg	1670	1100	66	34-125	
N-Nitrosodiphenylamine	ug/kg	1670	1420	85	53-125	
Naphthalene	ug/kg	1670	1310	79	44-125	
Nitrobenzene	ug/kg	1670	1250	75	44-125	
Pentachlorophenol	ug/kg	1670	1390	83	41-125	
Phenanthrene	ug/kg	1670	1440	86	61-125	
Phenol	ug/kg	1670	1220	73	45-125	
Pyrene	ug/kg	1670	1410	85	62-125	
2,4,6-Tribromophenol (S)	%			78	30-125	
2-Fluorobiphenyl (S)	%			71	54-125	
2-Fluorophenol (S)	%			68	41-125	
Nitrobenzene-d5 (S)	%			72	47-125	
p-Terphenyl-d14 (S)	%			76	58-125	
Phenol-d6 (S)	%			66	48-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3249288 3249289

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10471713001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,2,4-Trichlorobenzene	ug/kg	ND	1870	1870	1420	1400	76	74	41-125	2	30	H3
1,2-Dichlorobenzene	ug/kg	ND	1870	1870	1280	1310	68	70	37-125	2	30	H3
1,2-Diphenylhydrazine	ug/kg	ND	1870	1870	1630	1580	87	84	51-125	3	30	H3
1,3-Dichlorobenzene	ug/kg	ND	1870	1870	1240	1240	66	66	35-125	0	30	H3
1,4-Dichlorobenzene	ug/kg	ND	1870	1870	1250	1270	67	68	36-125	1	30	H3
1-Methylnaphthalene	ug/kg	ND	1870	1870	1480	1460	79	78	47-125	2	30	H3
2,4,5-Trichlorophenol	ug/kg	ND	1870	1870	1560	1520	83	81	52-125	2	30	H3
2,4,6-Trichlorophenol	ug/kg	ND	1870	1870	1610	1570	86	84	51-125	3	30	H3
2,4-Dichlorophenol	ug/kg	ND	1870	1870	1490	1470	80	79	51-125	1	30	H3
2,4-Dimethylphenol	ug/kg	ND	1870	1870	1550	1500	82	80	30-125	3	30	H3
2,4-Dinitrophenol	ug/kg	ND	1870	1870	1090	1150	58	61	30-125	6	30	H3
2,4-Dinitrotoluene	ug/kg	ND	1870	1870	1660	1650	88	88	30-125	0	30	H3
2,6-Dinitrotoluene	ug/kg	ND	1870	1870	1630	1570	87	84	31-125	4	30	H3
2-Chloronaphthalene	ug/kg	ND	1870	1870	1520	1490	81	80	55-125	2	30	H3
2-Chlorophenol	ug/kg	ND	1870	1870	1420	1410	76	75	41-125	1	30	H3
2-Methylnaphthalene	ug/kg	ND	1870	1870	1490	1430	79	76	47-125	4	30	H3
2-Methylphenol(o-Cresol)	ug/kg	ND	1870	1870	1460	1440	78	77	42-125	1	30	H3
2-Nitroaniline	ug/kg	ND	1870	1870	1630	1580	87	84	54-125	3	30	H3
2-Nitrophenol	ug/kg	ND	1870	1870	1520	1470	81	78	30-125	4	30	H3
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	1870	1870	1450	1430	77	76	47-125	2	30	H3
3,3'-Dichlorobenzidine	ug/kg	ND	1870	1870	1540	1540	82	82	30-125	0	30	H3
3-Nitroaniline	ug/kg	ND	1870	1870	1290	1380	69	74	30-149	7	30	H3
4,6-Dinitro-2-methylphenol	ug/kg	ND	1870	1870	1310J	1320J	70	70	30-125		30	H3

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		3249288			3249289								
Parameter	Units	10471713001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max			
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual	
4-Bromophenylphenyl ether	ug/kg	ND	1870	1870	1610	1600	86	85	57-125	1	30	H3	
4-Chloro-3-methylphenol	ug/kg	ND	1870	1870	1580	1550	84	82	55-125	2	30	H3	
4-Chloroaniline	ug/kg	ND	1870	1870	1100	1170	59	62	30-125	6	30	H3	
4-Chlorophenylphenyl ether	ug/kg	ND	1870	1870	1610	1560	86	83	58-125	3	30	H3	
4-Nitroaniline	ug/kg	ND	1870	1870	1550	1540	83	82	41-125	1	30	H3	
4-Nitrophenol	ug/kg	ND	1870	1870	1630	1600	87	85	30-131	1	30	H3	
Acenaphthene	ug/kg	ND	1870	1870	1550	1530	83	81	51-125	2	30	H3	
Acenaphthylene	ug/kg	ND	1870	1870	1580	1530	84	81	52-125	4	30	H3	
Anthracene	ug/kg	ND	1870	1870	1670	1620	89	86	54-125	3	30	H3	
Benzo(a)anthracene	ug/kg	ND	1870	1870	1560	1540	83	82	48-125	1	30	H3	
Benzo(a)pyrene	ug/kg	ND	1870	1870	1660	1620	89	86	51-125	3	30	H3	
Benzo(b)fluoranthene	ug/kg	ND	1870	1870	1710	1660	91	89	50-125	3	30	H3	
Benzo(g,h,i)perylene	ug/kg	ND	1870	1870	1620	1590	86	85	48-125	2	30	H3	
Benzo(k)fluoranthene	ug/kg	ND	1870	1870	1630	1590	87	85	48-125	3	30	H3	
bis(2-Chloroethoxy)methane	ug/kg	ND	1870	1870	1490	1440	79	77	45-125	3	30	H3	
bis(2-Chloroethyl) ether	ug/kg	ND	1870	1870	1380	1340	74	71	34-125	3	30	H3	
bis(2-Chloroisopropyl) ether	ug/kg	ND	1870	1870	1380	1370	74	73	33-125	1	30	H3	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	1870	1870	1710	1700	91	90	52-125	1	30	H3	
Butylbenzylphthalate	ug/kg	ND	1870	1870	1650	1610	88	86	53-125	2	30	H3	
Carbazole	ug/kg	ND	1870	1870	1660	1610	89	86	54-125	4	30	H3	
Chrysene	ug/kg	ND	1870	1870	1630	1640	87	87	49-125	0	30	H3	
Di-n-butylphthalate	ug/kg	ND	1870	1870	1720	1690	92	90	60-125	2	30	H3	
Di-n-octylphthalate	ug/kg	ND	1870	1870	1680	1680	90	89	52-125	0	30	H3	
Dibenz(a,h)anthracene	ug/kg	ND	1870	1870	1670	1600	89	85	51-125	4	30	H3	
Dibenzofuran	ug/kg	ND	1870	1870	1600	1550	85	82	55-125	3	30	H3	
Diethylphthalate	ug/kg	ND	1870	1870	1630	1590	87	85	61-125	2	30	H3	
Dimethylphthalate	ug/kg	ND	1870	1870	1620	1560	86	83	58-125	4	30	H3	
Fluoranthene	ug/kg	ND	1870	1870	1670	1630	89	87	47-125	3	30	H3	
Fluorene	ug/kg	ND	1870	1870	1610	1560	86	83	51-125	3	30	H3	
Hexachloro-1,3-butadiene	ug/kg	ND	1870	1870	1370	1370	73	73	38-125	0	30	H3	
Hexachlorobenzene	ug/kg	ND	1870	1870	1590	1610	85	86	52-125	1	30	H3	
Hexachloroethane	ug/kg	ND	1870	1870	1220	1220	65	65	30-125	0	30	H3	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	1870	1870	1640	1590	88	85	47-125	4	30	H3	
Isophorone	ug/kg	ND	1870	1870	1510	1470	81	79	46-125	2	30	H3	
N-Nitroso-di-n-propylamine	ug/kg	ND	1870	1870	1390	1420	74	76	44-125	2	30	H3	
N-Nitrosodimethylamine	ug/kg	ND	1870	1870	1330	1360	71	73	30-125	3	30	H3	
N-Nitrosodiphenylamine	ug/kg	ND	1870	1870	1660	1610	88	86	40-125	3	30	H3	
Naphthalene	ug/kg	ND	1870	1870	1480	1460	79	78	43-125	1	30	H3	
Nitrobenzene	ug/kg	ND	1870	1870	1430	1440	76	77	42-125	0	30	H3	
Pentachlorophenol	ug/kg	ND	1870	1870	1610	1590	86	85	30-129	1	30	H3	
Phenanthrene	ug/kg	ND	1870	1870	1640	1610	88	86	50-125	2	30	H3	
Phenol	ug/kg	ND	1870	1870	1410	1400	75	74	43-125	1	30	H3	
Pyrene	ug/kg	ND	1870	1870	1640	1610	88	86	41-125	2	30	H3	
2,4,6-Tribromophenol (S)	%						81	78	30-125				
2-Fluorobiphenyl (S)	%						73	70	54-125				

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3249288												3249289	
Parameter	Units	10471713001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
2-Fluorophenol (S)	%.							70	69	41-125			
Nitrobenzene-d5 (S)	%.							74	72	47-125			
p-Terphenyl-d14 (S)	%.							78	76	58-125			
Phenol-d6 (S)	%.							69	67	48-125			

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock
Pace Project No.: 10471713

QC Batch: 497804 Analysis Method: EPA 7196A
QC Batch Method: EPA 3060A Analysis Description: 7196 Chromium, Hexavalent
Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 2296303 Matrix: Solid
Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	2.0	05/02/19 09:07	

LABORATORY CONTROL SAMPLE: 2296304

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	1080	1090	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2296306 2296307

Parameter	Units	50223332012 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits			
Chromium, Hexavalent	mg/kg	ND	1150	1060	1170	1110	102	105	75-125	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2296308 2296309

Parameter	Units	50223332012 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits			
Chromium, Hexavalent	mg/kg	ND	42.5	42.1	40.6	39.9	94	93	75-125	2	20	

SAMPLE DUPLICATE: 2296305

Parameter	Units	50223332010 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND		20	

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 164814

Analysis Method: EPA 350.1

QC Batch Method: EPA 350.1

Analysis Description: 350.1 Ammonia

Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 649461

Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/kg	ND	2.7	04/26/19 08:54	

LABORATORY CONTROL SAMPLE: 649460

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/kg	143	144	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 649462 649463

Parameter	Units	649462		649463		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10471713001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, Ammonia	mg/kg	30.5	153	153	213	223	118	125	90-110	5	10 M1

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 319695 Analysis Method: EPA 9012B
QC Batch Method: EPA 9012B Analysis Description: 9012 Cyanide
Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 1857904 Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	mg/kg	ND	0.40	04/29/19 13:24	

LABORATORY CONTROL SAMPLE: 1857905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	mg/kg	3	2.9	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1857906 1857907

Parameter	Units	40186327006 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	mg/kg	0.29J	2.75	2.75	2.9	2.8	94	90	80-120	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1857908 1857909

Parameter	Units	40186472002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	mg/kg	0.41	2.91	3.02	2.7	3.2	77	92	80-120	18	20 M0	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 165021

Analysis Method: EPA 9056A

QC Batch Method: EPA 300.0

Analysis Description: 9056 IC Anions, Soil

Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 650204

Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/kg	ND	10.0	04/29/19 15:40	

LABORATORY CONTROL SAMPLE: 650203

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/kg	498	528	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 650205 650206

Parameter	Units	650205		650206		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		10471713001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Chloride	mg/kg	44.4	497	502	561	571	104	105	80-120	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

Sample: FL-MW-E2 (33-35 ft) **Lab ID: 10471713001** Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 9310	1.49 ± 5.11 (12.1) C:NA T:NA	pCi/g	05/01/19 08:00	12587-46-1	
Gross Beta	EPA 9310	7.40 ± 3.51 (5.90) C:NA T:NA	pCi/g	05/01/19 08:00	12587-47-2	

Sample: FL-MW-D2 (27-29.5 ft) **Lab ID: 10471713002** Collected: 04/02/19 00:00 Received: 04/22/19 14:32 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 9310	4.91 ± 6.55 (13.7) C:NA T:NA	pCi/g	05/01/19 08:00	12587-46-1	
Gross Beta	EPA 9310	13.1 ± 4.33 (5.85) C:NA T:NA	pCi/g	05/01/19 08:00	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

QC Batch: 340285

Analysis Method: EPA 9310

QC Batch Method: EPA 9310

Analysis Description: 9310 Gross Alpha/Beta

Associated Lab Samples: 10471713001, 10471713002

METHOD BLANK: 1656100

Matrix: Solid

Associated Lab Samples: 10471713001, 10471713002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.135 ± 0.109 (0.195) C:NA T:NA	pCi/g	05/01/19 07:59	
Gross Beta	0.084 ± 0.131 (0.279) C:NA T:NA	pCi/g	05/01/19 07:59	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

PASI-G Pace Analytical Services - Green Bay

PASI-I Pace Analytical Services - Indianapolis

PASI-M Pace Analytical Services - Minneapolis

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10471713

[1] The samples were received outside of required temperature range. Analysis was completed upon client approval.

ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

H3 Sample was received or analysis requested beyond the recognized method holding time.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 Freeway LF Bedrock

Pace Project No.: 10471713

ANALYTE QUALIFIERS

- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
- R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 Freeway LF Bedrock
Pace Project No.: 10471713

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10471713001	FL-MW-E2 (33-35 ft)	EPA 3550	601500	EPA 8082A	601635
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 3550	601500	EPA 8082A	601635
10471713001	FL-MW-E2 (33-35 ft)	EPA 3050	601351	EPA 6010D	601441
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 3050	601351	EPA 6010D	601441
10471713001	FL-MW-E2 (33-35 ft)	EPA 3050	601940	EPA 6020B	602639
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 3050	601940	EPA 6020B	602639
10471713001	FL-MW-E2 (33-35 ft)	ASTM D2974	604542		
10471713002	FL-MW-D2 (27-29.5 ft)	ASTM D2974	604542		
10471713001	FL-MW-E2 (33-35 ft)	EPA 3550	601210	EPA 8270D	601657
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 3550	601210	EPA 8270D	601657
10471713001	FL-MW-E2 (33-35 ft)	EPA 5035/5030B	601121	EPA 8260B	601184
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 5035/5030B	601121	EPA 8260B	601184
10471713001	FL-MW-E2 (33-35 ft)	EPA 8260B Mod.	471790	EPA 8260B Mod.	471887
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 8260B Mod.	471790	EPA 8260B Mod.	471887
10471713001	FL-MW-E2 (33-35 ft)	EPA 9310	340285		
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 9310	340285		
10471713001	FL-MW-E2 (33-35 ft)	EPA 3060A	497804	EPA 7196A	497954
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 3060A	497804	EPA 7196A	497954
10471713001	FL-MW-E2 (33-35 ft)	EPA 350.1	164814	EPA 350.1	164842
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 350.1	164814	EPA 350.1	164842
10471713001	FL-MW-E2 (33-35 ft)	EPA 9012B	319695	EPA 9012B	319753
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 9012B	319695	EPA 9012B	319753
10471713001	FL-MW-E2 (33-35 ft)	EPA 300.0	165021	EPA 9056A	165022
10471713002	FL-MW-D2 (27-29.5 ft)	EPA 300.0	165021	EPA 9056A	165022

REPORT OF LABORATORY ANALYSIS

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Minnesota Pollution Control Agency

Chain-of-Custody Form revision 2013.0909

Work Order Number:

COC Type:

Page: { of {

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MNSW-057

Program Code (MDH Lab Only):

Lab Name:

Pace Analytical - Minneapolis, MN

Project Name: 19-01567 MPCA Freeway LF 2019 Bedrock

Project Task Code: PRJ07786

Address: 1700 SE Elm Street

Project Manager: Brad Jacobson

612-607-6375

EPIC PROFILE #: 38716 Line 1

Minneapolis

MN

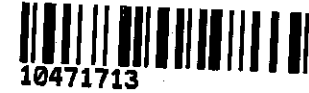
55414

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 612-607-6400

WO#: 10471713



SAMPLE DETAILS

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wtr-Ground=Groundwater
Wtr-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

PRESERV.

ANALYSIS

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	Chloride (300.0)	Ammonia-N (350.1), Total CN (9012), SVOCs (8270)	Metals 6010: Al, Ba, Cu, Mn, Ni, Ag, Sn, Zn	Metals 6020: Sb, As, Be, B, Cd, Cr, Co, Pb, Se, Ti, U, V	VOCs (8260B) Hex-Cr (7196), 1,4-Dioxane (8260)	Her/Pes. EPA 8151 MDA List I & II PCBs (8082)	Gross Alpha/Beta (9310)	Lab Sample No.	#	
FL-MW-E2 (33-35 ft)	Sample	4/2/2019	---	---	---	C	SD		N	Bulk bedrock rec'vd from Barr 4/10/19		X	X	X	X	X	X	X	001	1	
FL-MW-D2 (27-29.5 ft)	Sample	4/2/2019	---	---	---	C	SD		N	Bulk bedrock rec'vd from Barr 4/10/19		X	X	X	X	X	X	X	002	2	
																				3	
																					4
																					5
																					6
																					7
																					8
																					9
																					10

4/22/19
NW

Sampled By: Barr Engineering Staff

Sampler's Signature:

Not Available - Material received without COC

Phone #:

Receiving Comments:

Relinquished By/Affiliation

Date/Time

Accepted By/ Affiliation

Date/Time

(Sampler)*Pace staff containerizing crushed material:

Daniel George Pace

4/22/19/1432

AL PACE

4-22-19 1432

T=20.7°C

Sample Condition Upon Receipt

Client Name: MPCA / Govt Engineering Project #: _____

WO#: 10471713
 PM: JMA Due Date: 04/29/19
 CLIENT: PASI-MNFLD

Courier: FedEx UPS USPS Client
 Pace SpeeDee Commercial See Exception

Tracking Number: _____
 Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer: T1(0461) T2(1336) T3(0459) T4(0254) T5(0048) Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 5°C	Cooler Temp Read w/temp blank: _____ °C	Average Corrected Temp (no temp blank only): <u>20.7°C</u> See Exceptions <input checked="" type="checkbox"/>
Correction Factor: <u>1.02</u>	Cooler Temp Corrected w/temp blank: _____ °C	

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: TJW/2/2/19
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: <u>No collection is reqd.</u> See Exception <input type="checkbox"/>
Matrix: <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other _____		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> NaOH <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. Chlorine? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No pH Paper Lot# _____ See Exception <input type="checkbox"/>
		Res. Chlorine 0-6 Roll _____ 0-6 Strip _____ 0-14 Strip _____
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased): <u>MA</u>

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: Confirmed with Brad to proceed out of hold and temperature.

Project Manager Review:

J. Anderson Date: 04/23/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: TJW



Document Name:
SCUR Exception Form – Coolers Above 6°C

Document Revised: 08Apr2019
Page 1 of 1

Document No.:
F-MN-C-298-Rev.02

Issuing Authority:
Pace Minnesota Quality Office

During sample triage, this form is to be placed in each cooler that arrives above 6.0 degrees Celsius

SCUR Exceptions:

Workorder #:

Out of Temp Sample IDs	Container Type	# of Containers	PM Notified? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																		
			If yes, indicate who was contacted/date/time. If no, indicate reason why. <i>On ice</i>																		
			Multiple Cooler Project? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If you answered yes, fill out information to the left.																		
			<table border="1"><thead><tr><th colspan="3">No Temp Blank</th></tr><tr><th>Read Temp</th><th>Corrected Temp</th><th>Average Temp</th></tr></thead><tbody><tr><td><i>20.9</i></td><td><i>20.9</i></td><td><i>20.7</i></td></tr><tr><td><i>20.6</i></td><td><i>20.6</i></td><td></td></tr><tr><td><i>21.0</i></td><td><i>21.0</i></td><td></td></tr><tr><td><i>20.4</i></td><td><i>20.4</i></td><td></td></tr></tbody></table>	No Temp Blank			Read Temp	Corrected Temp	Average Temp	<i>20.9</i>	<i>20.9</i>	<i>20.7</i>	<i>20.6</i>	<i>20.6</i>		<i>21.0</i>	<i>21.0</i>		<i>20.4</i>	<i>20.4</i>	
No Temp Blank																					
Read Temp	Corrected Temp	Average Temp																			
<i>20.9</i>	<i>20.9</i>	<i>20.7</i>																			
<i>20.6</i>	<i>20.6</i>																				
<i>21.0</i>	<i>21.0</i>																				
<i>20.4</i>	<i>20.4</i>																				

Tracking Number/Temperature

Other Issues		
Issue Type:	Container Type	# of Containers
Sample ID		

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preserv.	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance after addition? <input type="checkbox"/> Yes <input type="checkbox"/> No	Initials
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO# : 12123960
PM: CLJ Due Date: 05/13/19
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.6 Cooler Temp Corrected °C: 0.9 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 4/23/19 DC

Comments: 244/24/19

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SK</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Carrigan Date: 4/24/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Owner Received Date: 4/22/2019 Results Requested By: 5/13/2019



Workorder: 10471713 Workorder Name: 19-01567 Freeway LF Bedrock

Report To	Subcontract To	Requested Analysis	
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600	<p>WO# : 30290914</p> <p>30290914</p>	

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers										Gross Alpha/Beta	LAB USE ONLY								
						Unpreserved	J	G	E	L	1	2	3	4	5			6	7	8	9	0			
1	FL-MW-E2 (33-35 ft)	PS	4/2/2019 00:00	10471713001	Solid	1																	X	CO1	
2	FL-MW-D2 (27-29.5 ft)	PS	4/2/2019 00:00	10471713002	Solid	1																	X	CO2	
3																									
4																									
5																									

Transfers						Comments
Released By	Date/Time	Received By	Date/Time			
<i>[Signature]</i>	4/2/2019 13:30	<i>[Signature]</i>	4/24/19 09:30			Okay to proceed out of hold

Cooler Temperature on Receipt 5.0 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

5.7

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Dale MN

Project # # 30290914

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4638 0196 0499

Label	<u>ET</u>
LIMS Login	<u>ET</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 11 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 5.7 °C Correction Factor: 0.0 °C Final Temp: 5.7 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>10D3581</u>	<u>ET 4-24-19</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.	
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.	
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.	
-Includes date/time/ID Matrix: <u>SL</u>					
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.	
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.	
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.	
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.	
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.	
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.	
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.	
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.	
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.	
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.	
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon (Non-aqueous matrix)					
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed <u>ET</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.	
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.	
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ET</u>	Date: <u>4-24-19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No



Workorder: 10471713

Workorder Name: 19-01567 Freeway LF Bedrock

Owner Received Date: 4/22/2019

Results Requested By: 5/13/2019

Report To		Subcontract To					Requested Analysis																	
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Indianapolis 7726 Moller Road Indianapolis, IN 46268 Phone (317)228-3100					<div style="text-align: right;">50223045</div>																	
																			LAB USE ONLY					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved JG/UFU	Preserved Containers																	
1	FL-MW-E2 (33-35 ft)	PS	4/2/2019 00:00	10471713001	Solid	1																		
2	FL-MW-D2 (27-29.5 ft)	PS	4/2/2019 00:00	10471713002	Solid	1																		
3																								
4																								
5																								
Transfers		Released By	Date/Time	Received By		Date/Time	Comments																	
1		<i>[Signature]</i>	4/23/19 1430	Fed Ex			Okay to proceed out of hold																	
2		Fed Ex		<i>[Signature]</i>		4/24/19 0900																		
3																								
Cooler Temperature on Receipt			6.0 °C	Custody Seal <input checked="" type="checkbox"/> or N			Received on Ice <input checked="" type="checkbox"/> or N			Samples Intact <input checked="" type="checkbox"/> or N														

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50223045

Date/Time and Initials of person examining contents: ZL 4-24-19 16:56

Courier: Fed Ex UPS USPS Client Commercial Pace Other

Tracking #: 4638 0196 0769

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer: 103456ABCDEF Ice Type: Wet Blue None Samples collected today and on ice: Yes No N/A

Cooler Temperature: 0.8/1.0 Ice Visible in Sample Containers?: Yes No N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: Yes No N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		<input checked="" type="checkbox"/>	All containers needing acid/base pres. Have been checked?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.			<input checked="" type="checkbox"/>
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted.			
Chain of Custody Present:	<input checked="" type="checkbox"/>		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>		Dissolved Metals field filtered?:			<input checked="" type="checkbox"/>
Short Hold Time Analysis (<72hr)? Analysis:		<input checked="" type="checkbox"/>	Headspace Wisconsin Sulfide			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab:			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<u>N/A</u>
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Rush TAT Requested:		<input checked="" type="checkbox"/>	Headspace in VOA Vials (>6mm):			<input checked="" type="checkbox"/>
Containers Intact?:	<input checked="" type="checkbox"/>		Trip Blank Present?:		<input checked="" type="checkbox"/>	
Sample Label (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Custody Seals?:		<input checked="" type="checkbox"/>	

Comments:

Sample Container Count

WO#: 50223045

CLIENT: Pace MN

COC PAGE 1 of 1

COC ID# _____

Project # 50223045



50223045

SBS
Bulk Kit

Matrix S/
(Soil/Water)
Aqueous

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R	JGFU	Matrix S/ (Soil/Water) Aqueous	pH <2	pH >9	pH >12
1																			1	SL			
2																			1	SL			
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass	BP1S	1 liter H2SO4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG1U	1 liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H2SO4 amber glass	BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber	BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass	BP3B	250mL NaOH plastic		
WGKU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H2SO4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

Page 51 of 70

JW

60186358

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Owner Received Date: 4/22/2019 Results Requested By: 5/13/2019



Workorder: 10471713 Workorder Name: 19-01567 Freeway LF Bedrock

Report To		Subcontract To					Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436																				
							9012 Cyanide															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved JGFU	Preserved Containers										LAB USE ONLY					
1	FL-MW-E2 (33-35 ft)	PS	4/2/2019 00:00	10471713001	Solid	1															X	
2	FL-MW-D2 (27-29.5 ft)	PS	4/2/2019 00:00	10471713002	Solid	1															X	
3																						
4																						
5																						

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/2/2019 1300	<i>[Signature]</i>		Okay to proceed out of hold
2	<i>Walt</i>	4/24/2019 0900	<i>Susan [Signature]</i>	4-24-19 0900	
3					

Cooler Temperature on Receipt *2* °C Custody Seal *Y* or N Received on Ice *Y* or N Samples Intact *Y* or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Client Name: Pace, MN Sample Preservation Receipt Form
 Project # 10186358

All containers needing preservation have been checked and noted below: Yes No N/A

Lab Lot# of pH paper:

Lab Std #ID of preservation (if pH adjusted):

Initial when completed:

Date/ Time:

Pace Lab #	Glass							Plastic							Vials					Jars			General			VOA Vials (>6mm) *	H ₂ SO ₄ pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO ₃ pH ≤2	pH after adjusted	Volume (mL)						
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC								GN					
001																																						
002																																						2.5 / 5 / 10
003																																						2.5 / 5 / 10
004																																						2.5 / 5 / 10
005																																						2.5 / 5 / 10
006																																						2.5 / 5 / 10
007																																						2.5 / 5 / 10
008																																						2.5 / 5 / 10
009																																						2.5 / 5 / 10
010																																						2.5 / 5 / 10
011																																						2.5 / 5 / 10
012																																						2.5 / 5 / 10
013																																						2.5 / 5 / 10
014																																						2.5 / 5 / 10
015																																						2.5 / 5 / 10
016																																						2.5 / 5 / 10
017																																						2.5 / 5 / 10
018																																						2.5 / 5 / 10
019																																						2.5 / 5 / 10
020																																						2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other:

Headspace in VOA Vials (>6mm): Yes No N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO ₃	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H ₂ SO ₄	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH		
AG2S	500 mL amber glass H ₂ SO ₄	BP3N	250 mL plastic HNO ₃	VG9D	40 mL clear vial DI	SP5T	120 mL plastic Na Thiosulfate
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H ₂ SO ₄			ZPLC	ziploc bag
						GN:	



1241 Bellevue Street, Green Bay, WI 54302

Document Name: Sample Condition Upon Receipt (SCUR)

Document Revised: 25Apr2018

Document No.: F-GB-C-031-Rev.07

Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, MN

Project #: _____

WO#: 40186358

40186358

Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Tracking #: 2037573

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 9 Type of Ice: Wet Blue Dry None

Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 1.5 ICorr: 2

Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 4-24-19
Initials: SRW

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>IRWO</u>
Samples Arrived within Hold Time:	<input type="checkbox"/> Yes <input type="checkbox"/> No	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
-Pace IR Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

4-24-19
SRW

Client Notification/ Resolution: _____

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

If checked, see attached form for additional comments

Project Manager Review: CW

Date: 4/25/19

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Workorder: 10471713 Workorder Name: 19-01567 Freeway LF Bedrock

Owner Received Date: 4/22/2019 Results Requested By: 5/13/2019

Report To		Subcontract To				Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Charlotte 9800 Kincey Ave. Suite 100 Huntersville, NC 28078 Phone (704)875-9092																		
						Preserved Containers														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved JGEU														
1	FL-MW-E2 (33-35 ft)	PS	4/2/2019 00:00	10471713001	Solid	1														
2	FL-MW-D2 (27-29.5 ft)	PS	4/2/2019 00:00	10471713002	Solid	1														
3																				
4																				
5																				
																	LAB USE ONLY			
																	001			
																	002			
																	62426553			
Transfers																	Comments			
Released By	Date/Time	Received By	Date/Time																	
<i>[Signature]</i>	4/23/19 1400	<i>[Signature]</i>	4-24-19 9:17	Okay to proceed out of hold																
				Cooler Temperature on Receipt <u>3.3</u> °C																
				Custody Seal <input checked="" type="checkbox"/> or N																
				Received on Ice <input checked="" type="checkbox"/> or N																
				Samples Intact <input checked="" type="checkbox"/> or N																

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Laboratory receiving samples:

Asheville Eden Greenwood Huntersville Raleigh Mechanicsville

Sample Condition Upon Receipt

Client Name: Pace Minnesota

Project #

WO# : 92426553



Date/Initials Person Examining Contents: TF 4-24-19

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Custody Seal Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other

Biological Tissue Frozen? Yes No N/A

Thermometer: IR Gun ID: 92T048 Type of Ice: Wet Blue None

Cooler Temp (°C): 3.3 Correction Factor: Add/Subtract (°C) 0.0

Temp should be above freezing to 6°C
 Samples out of temp criteria. Samples on ice, cooling process has begun

Cooler Temp Corrected (°C): 3.3

USDA Regulated Soil (N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)?
 Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

	Comments/Discrepancy:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Samples Arrived within Hold Time? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	2.
Short Hold Time Analysis (<72 hr.)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	3.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Dissolved analysis: Samples Field Filtered? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
Headspace in VOA Vials (>5-6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? Yes No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: TC

Date: 4/24/19

Project Manager SRF Review: TC

Date: 4/24/19

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project #

WO# : 92426553

PM: RWC

Due Date: 05/13/19

CLIENT: Pasi-Minn

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A - lab)	SP2T-250 mL Sterile Plastic (N/A - lab)	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)	
1																												
2																												
3																												
4																												
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6																												
7																												
8																												
9																												
10																												
11																												
12																												

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

May 01, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: 19-01567 Freeway LF Bedrock

Enclosed are the analytical results for the samples received by the laboratory on 04/24/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2020
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2020
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FL-MW-E2 (33-35 ft)	A191708-01	Solid	04/02/2019	04/24/2019
FL-MW-D2 (27-29.5 ft)	A191708-02	Solid	04/02/2019	04/24/2019

CASE NARRATIVE

Sample Receipt Information:

2 samples were received on 04/24/2019. Samples were received at 3.8 degrees Celsius. Samples were received in acceptable condition, with the exception of the hold time issues noted below.

Samples A191708-01 and A191708-02 were received past recommended hold time. Client instructed the lab to proceed with the analysis.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The E1 footnote on samples A191708-01 and A191708-02 indicates that there were quality control sample exceedances for MCPA. The LCS recovery was below acceptable limits. Please see the quality control section of the report for more information.



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

FL-MW-E2 (33-35 ft)

A191708-01 (Solid)

Date Sampled
04/02/2019 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry **Preparation Batch: A904219** **H**

Acetochlor	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Alachlor	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Atrazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Chlorpyrifos	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Cyanazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Desethylatrazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Deisopropylatrazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Dimethenamid	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
EPTC	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Ethalfuralin	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Fonofos	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Metolachlor	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Metribuzin	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Pendimethalin	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Phorate	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Prometon	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Propachlor	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Propazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Simazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Terbufos	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Triallate	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Trifluralin	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 14:49	EPA 8270D	
Surrogate: Atrazine-d5		86.2 %	52.6-121		04/29/2019	04/30/2019 14:49	EPA 8270D	
Surrogate: Parathion-d10		57.9 %	13.8-148		04/29/2019	04/30/2019 14:49	EPA 8270D	
Surrogate: Triphenyl phosphate		65.9 %	29.9-166		04/29/2019	04/30/2019 14:49	EPA 8270D	

Acid Herbicides by High Performance Liquid Chromatography **Preparation Batch: A904206** **H**

2,4-D	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	E1
Picloram	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 01:36	EPA 8321B	
Surrogate: DCAA		85.7 %	60.4-128		04/24/2019	04/25/2019 01:36	EPA 8321B	

Classical Chemistry Parameters **Preparation Batch: A904217**

% Solids	90.9	0.00	% by Weight	1	04/27/2019	04/29/2019 08:36	SM 2540B	
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

FL-MW-D2 (27-29.5 ft)

A191708-02 (Solid)

Date Sampled

04/02/2019 00:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904219

H

Acetochlor	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Alachlor	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Atrazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Chlorpyrifos	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Cyanazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Desethylatrazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Deisopropylatrazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Dimethenamid	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
EPTC	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Ethalfuralin	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Fonofos	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Metolachlor	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Metribuzin	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Pendimethalin	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Phorate	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Prometon	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Propachlor	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Propazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Simazine	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Terbufos	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Triallate	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Trifluralin	ND	0.050	mg/kg dry	1	04/29/2019	04/30/2019 15:17	EPA 8270D	
Surrogate: Atrazine-d5		90.1 %	52.6-121		04/29/2019	04/30/2019 15:17	EPA 8270D	
Surrogate: Parathion-d10		70.4 %	13.8-148		04/29/2019	04/30/2019 15:17	EPA 8270D	
Surrogate: Triphenyl phosphate		74.1 %	29.9-166		04/29/2019	04/30/2019 15:17	EPA 8270D	

Acid Herbicides by High Performance Liquid Chromatography

Preparation Batch: A904206

H

2,4-D	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	
2,4-DB	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	
2,4,5-T	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	
2,4,5-TP	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	
Bentazon	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	
Dicamba	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	
MCPA	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	E1
Picloram	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	
Triclopyr	ND	0.10	mg/kg dry	1	04/24/2019	04/25/2019 02:42	EPA 8321B	
Surrogate: DCAA		87.4 %	60.4-128		04/24/2019	04/25/2019 02:42	EPA 8321B	

Classical Chemistry Parameters

Preparation Batch: A904217

% Solids	94.7	0.00	% by Weight	1	04/27/2019	04/29/2019 08:36	SM 2540B	
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Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904219 - EPA 3570

Blank (A904219-BLK1)

Prepared: 04/29/2019 Analyzed: 04/30/2019 06:06

Acetochlor	ND	0.050	mg/kg wet							
Alachlor	ND	0.050	mg/kg wet							
Atrazine	ND	0.050	mg/kg wet							
Chlorpyrifos	ND	0.050	mg/kg wet							
Cyanazine	ND	0.050	mg/kg wet							
Desethylatrazine	ND	0.050	mg/kg wet							
Deisopropylatrazine	ND	0.050	mg/kg wet							
Dimethenamid	ND	0.050	mg/kg wet							
EPTC	ND	0.050	mg/kg wet							
Ethalfuralin	ND	0.050	mg/kg wet							
Fonofos	ND	0.050	mg/kg wet							
Metolachlor	ND	0.050	mg/kg wet							
Metribuzin	ND	0.050	mg/kg wet							
Pendimethalin	ND	0.050	mg/kg wet							
Phorate	ND	0.050	mg/kg wet							
Prometon	ND	0.050	mg/kg wet							
Propachlor	ND	0.050	mg/kg wet							
Propazine	ND	0.050	mg/kg wet							
Simazine	ND	0.050	mg/kg wet							
Terbufos	ND	0.050	mg/kg wet							
Triallate	ND	0.050	mg/kg wet							
Trifluralin	ND	0.050	mg/kg wet							
<i>Surrogate: Atrazine-d5</i>	0.212		mg/kg wet	0.2000		106	52.6-121			
<i>Surrogate: Parathion-d10</i>	0.141		mg/kg wet	0.2000		70.6	13.8-148			
<i>Surrogate: Triphenyl phosphate</i>	0.199		mg/kg wet	0.2000		99.4	29.9-166			

LCS (A904219-BS1)

Prepared: 04/29/2019 Analyzed: 04/30/2019 06:34

Acetochlor	0.403	0.050	mg/kg wet	0.4000		101	76.4-119			
Alachlor	0.383	0.050	mg/kg wet	0.4000		95.8	76.2-119			
Atrazine	0.377	0.050	mg/kg wet	0.4000		94.1	78.6-115			
Chlorpyrifos	0.388	0.050	mg/kg wet	0.4000		96.9	74.8-121			
Cyanazine	0.379	0.050	mg/kg wet	0.4000		94.9	55.2-143			
Desethylatrazine	0.384	0.050	mg/kg wet	0.4000		96.0	77-118			
Deisopropylatrazine	0.341	0.050	mg/kg wet	0.4000		85.3	69.5-121			
Dimethenamid	0.396	0.050	mg/kg wet	0.4000		98.9	78.8-119			
EPTC	0.349	0.050	mg/kg wet	0.4000		87.3	76.8-113			
Ethalfuralin	0.392	0.050	mg/kg wet	0.4000		98.1	61.6-130			
Fonofos	0.351	0.050	mg/kg wet	0.4000		87.7	72.5-117			
Metolachlor	0.389	0.050	mg/kg wet	0.4000		97.2	76.9-121			
Metribuzin	0.379	0.050	mg/kg wet	0.4000		94.8	75.1-118			
Pendimethalin	0.397	0.050	mg/kg wet	0.4000		99.4	60.2-136			
Phorate	0.363	0.050	mg/kg wet	0.4000		90.9	77.8-115			
Prometon	0.370	0.050	mg/kg wet	0.4000		92.5	69.1-120			
Propachlor	0.371	0.050	mg/kg wet	0.4000		92.6	78.2-116			
Propazine	0.388	0.050	mg/kg wet	0.4000		97.1	75.6-119			
Simazine	0.376	0.050	mg/kg wet	0.4000		93.9	77.7-115			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904219 - EPA 3570

LCS (A904219-BS1)

Prepared: 04/29/2019 Analyzed: 04/30/2019 06:34

Terbufos	0.361	0.050	mg/kg wet	0.4000		90.2	74.5-113			
Triallate	0.346	0.050	mg/kg wet	0.4000		86.4	72.5-117			
Trifluralin	0.404	0.050	mg/kg wet	0.4000		101	67.2-128			
<i>Surrogate: Atrazine-d5</i>	<i>0.212</i>		<i>mg/kg wet</i>	<i>0.2000</i>		<i>106</i>	<i>52.6-121</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.156</i>		<i>mg/kg wet</i>	<i>0.2000</i>		<i>77.9</i>	<i>13.8-148</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.179</i>		<i>mg/kg wet</i>	<i>0.2000</i>		<i>89.3</i>	<i>29.9-166</i>			

Matrix Spike (A904219-MS1)

Source: A191715-03

Prepared: 04/29/2019 Analyzed: 04/30/2019 07:03

Acetochlor	0.503	0.050	mg/kg dry	0.4421	0.0992	91.4	68.6-127			
Alachlor	0.424	0.050	mg/kg dry	0.4421	ND	96.0	69.7-125			
Atrazine	0.403	0.050	mg/kg dry	0.4421	ND	91.2	65.5-117			
Chlorpyrifos	0.424	0.050	mg/kg dry	0.4421	ND	95.9	75.8-124			
Cyanazine	0.325	0.050	mg/kg dry	0.4421	ND	73.5	25.1-148			
Desethylatrazine	0.297	0.050	mg/kg dry	0.4421	ND	67.2	24.2-130			
Deisopropylatrazine	0.219	0.050	mg/kg dry	0.4421	ND	49.5	12.4-126			
Dimethenamid	1.07	0.050	mg/kg dry	0.4421	0.608	105	69.3-125			
EPTC	0.408	0.050	mg/kg dry	0.4421	ND	92.2	74.1-118			
Ethalfuralin	0.435	0.050	mg/kg dry	0.4421	ND	98.5	62.9-137			
Fonofos	0.399	0.050	mg/kg dry	0.4421	ND	90.2	68.1-117			
Metolachlor	0.594	0.050	mg/kg dry	0.4421	0.178	94.2	62-137			
Metribuzin	0.379	0.050	mg/kg dry	0.4421	ND	85.8	55.6-127			
Pendimethalin	0.498	0.050	mg/kg dry	0.4421	ND	113	47.5-164			
Phorate	0.401	0.050	mg/kg dry	0.4421	ND	90.8	73.6-118			
Prometon	0.373	0.050	mg/kg dry	0.4421	ND	84.4	54.7-125			
Propachlor	0.387	0.050	mg/kg dry	0.4421	ND	87.6	67.2-119			
Propazine	0.429	0.050	mg/kg dry	0.4421	ND	97.1	70.1-120			
Simazine	0.341	0.050	mg/kg dry	0.4421	ND	77.1	55.2-120			
Terbufos	0.395	0.050	mg/kg dry	0.4421	ND	89.3	71.8-117			
Triallate	0.395	0.050	mg/kg dry	0.4421	ND	89.4	67.9-125			
Trifluralin	0.445	0.050	mg/kg dry	0.4421	ND	101	65.4-139			
<i>Surrogate: Atrazine-d5</i>	<i>0.204</i>		<i>mg/kg dry</i>	<i>0.2211</i>		<i>92.4</i>	<i>52.6-121</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.164</i>		<i>mg/kg dry</i>	<i>0.2211</i>		<i>74.3</i>	<i>13.8-148</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.183</i>		<i>mg/kg dry</i>	<i>0.2211</i>		<i>82.8</i>	<i>29.9-166</i>			

Matrix Spike Dup (A904219-MSD1)

Source: A191715-03

Prepared: 04/29/2019 Analyzed: 04/30/2019 07:31

Acetochlor	0.466	0.050	mg/kg dry	0.4421	0.0992	83.0	68.6-127	7.62	20	
Alachlor	0.407	0.050	mg/kg dry	0.4421	ND	92.1	69.7-125	4.11	20	
Atrazine	0.369	0.050	mg/kg dry	0.4421	ND	83.5	65.5-117	8.75	20	
Chlorpyrifos	0.429	0.050	mg/kg dry	0.4421	ND	97.0	75.8-124	1.20	20	
Cyanazine	0.315	0.050	mg/kg dry	0.4421	ND	71.2	25.1-148	3.14	20	
Desethylatrazine	0.290	0.050	mg/kg dry	0.4421	ND	65.6	24.2-130	2.55	20	
Deisopropylatrazine	0.235	0.050	mg/kg dry	0.4421	ND	53.1	12.4-126	7.03	20	
Dimethenamid	0.730	0.050	mg/kg dry	0.4421	0.608	27.6	69.3-125	37.9	20	M, X
EPTC	0.394	0.050	mg/kg dry	0.4421	ND	89.0	74.1-118	3.51	20	
Ethalfuralin	0.414	0.050	mg/kg dry	0.4421	ND	93.8	62.9-137	4.93	20	
Fonofos	0.394	0.050	mg/kg dry	0.4421	ND	89.1	68.1-117	1.14	20	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904219 - EPA 3570

Matrix Spike Dup (A904219-MSD1)

Source: A191715-03

Prepared: 04/29/2019 Analyzed: 04/30/2019 07:31

Metolachlor	0.508	0.050	mg/kg dry	0.4421	0.178	74.8	62-137	15.5	20	
Metribuzin	0.359	0.050	mg/kg dry	0.4421	ND	81.3	55.6-127	5.44	20	
Pendimethalin	0.461	0.050	mg/kg dry	0.4421	ND	104	47.5-164	7.52	20	
Phorate	0.387	0.050	mg/kg dry	0.4421	ND	87.5	73.6-118	3.73	20	
Prometon	0.365	0.050	mg/kg dry	0.4421	ND	82.5	54.7-125	2.24	20	
Propachlor	0.394	0.050	mg/kg dry	0.4421	ND	89.2	67.2-119	1.83	20	
Propazine	0.391	0.050	mg/kg dry	0.4421	ND	88.3	70.1-120	9.40	20	
Simazine	0.353	0.050	mg/kg dry	0.4421	ND	79.8	55.2-120	3.36	20	
Terbufos	0.404	0.050	mg/kg dry	0.4421	ND	91.4	71.8-117	2.32	20	
Triallate	0.393	0.050	mg/kg dry	0.4421	ND	88.9	67.9-125	0.606	20	
Trifluralin	0.442	0.050	mg/kg dry	0.4421	ND	99.9	65.4-139	0.807	20	
Surrogate: Atrazine-d5	0.222		mg/kg dry	0.2211		100	52.6-121			
Surrogate: Parathion-d10	0.169		mg/kg dry	0.2211		76.6	13.8-148			
Surrogate: Triphenyl phosphate	0.192		mg/kg dry	0.2211		86.9	29.9-166			

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Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904206 - EPA 3570

Blank (A904206-BLK1)

Prepared: 04/24/2019 Analyzed: 04/24/2019 20:04

2,4-D	ND	0.10	mg/kg wet							
2,4-D [2C]	ND	0.10	mg/kg wet							
2,4-DB	ND	0.10	mg/kg wet							
2,4-DB [2C]	ND	0.10	mg/kg wet							
2,4,5-T	ND	0.10	mg/kg wet							
2,4,5-T [2C]	ND	0.10	mg/kg wet							
2,4,5-TP	ND	0.10	mg/kg wet							
2,4,5-TP [2C]	ND	0.10	mg/kg wet							
Bentazon	ND	0.10	mg/kg wet							
Bentazon [2C]	ND	0.10	mg/kg wet							
Dicamba	ND	0.10	mg/kg wet							
Dicamba [2C]	ND	0.10	mg/kg wet							
MCPA	ND	0.10	mg/kg wet							
MCPA [2C]	ND	0.10	mg/kg wet							
Picloram	ND	0.10	mg/kg wet							
Picloram [2C]	ND	0.10	mg/kg wet							
Triclopyr	ND	0.10	mg/kg wet							
Triclopyr [2C]	ND	0.10	mg/kg wet							
Surrogate: DCAA	16.9		mg/kg wet	20.00		84.7	60.4-128			
Surrogate: DCAA [2C]	18.8		mg/kg wet	20.00		93.9	44.7-125			

LCS (A904206-BS1)

Prepared: 04/24/2019 Analyzed: 04/24/2019 21:10

2,4-D	1.79	0.10	mg/kg wet	2.000		89.7	82.8-109			
2,4-D [2C]	1.87	0.10	mg/kg wet	2.000		93.6	69.6-116			
2,4-DB	1.75	0.10	mg/kg wet	2.000		87.6	77.8-102			
2,4-DB [2C]	1.83	0.10	mg/kg wet	2.000		91.4	68.4-114			
2,4,5-T	1.79	0.10	mg/kg wet	2.000		89.3	84.8-108			
2,4,5-T [2C]	1.89	0.10	mg/kg wet	2.000		94.6	71.5-119			
2,4,5-TP	1.77	0.10	mg/kg wet	2.000		88.6	82.1-104			
2,4,5-TP [2C]	1.85	0.10	mg/kg wet	2.000		92.4	60.2-130			
Bentazon	1.04	0.10	mg/kg wet	1.000		104	77.4-126			
Bentazon [2C]	0.952	0.10	mg/kg wet	1.000		95.2	62.7-130			
Dicamba	1.85	0.10	mg/kg wet	2.000		92.4	83.8-111			
Dicamba [2C]	1.93	0.10	mg/kg wet	2.000		96.7	70.7-118			
Picloram	0.910	0.10	mg/kg wet	1.000		91.0	71.9-121			
Picloram [2C]	1.17	0.10	mg/kg wet	1.000		117	67.3-115			
Triclopyr	1.77	0.10	mg/kg wet	2.000		88.4	83.8-106			
Triclopyr [2C]	1.82	0.10	mg/kg wet	2.000		91.2	66.7-116			
Surrogate: DCAA	17.0		mg/kg wet	20.00		85.0	60.4-128			
Surrogate: DCAA [2C]	18.8		mg/kg wet	20.00		93.9	44.7-125			

LCS (A904206-BS2)

Prepared: 04/24/2019 Analyzed: 04/24/2019 22:17

MCPA	3.51	0.10	mg/kg wet	4.000		87.7	88.6-119			
MCPA [2C]	3.58	0.10	mg/kg wet	4.000		89.6	68.5-130			
Surrogate: DCAA	17.3		mg/kg wet	20.00		86.4	60.4-128			
Surrogate: DCAA [2C]	17.8		mg/kg wet	20.00		89.1	44.7-125			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904206 - EPA 3570

Matrix Spike (A904206-MS1)		Source: A191618-02		Prepared: 04/24/2019 Analyzed: 04/25/2019 06:01						
2,4-D	1.98	0.10	mg/kg dry	2.720	0.528	53.3	68.8-106			M
2,4-D [2C]	1.81	0.10	mg/kg dry	2.720	0.513	47.5	36-125			
2,4-DB	1.48	0.10	mg/kg dry	2.720	0.107	50.3	41.2-115			
2,4-DB [2C]	1.62	0.10	mg/kg dry	2.720	ND	59.7	18.1-131			
2,4,5-T	1.64	0.10	mg/kg dry	2.720	ND	60.5	39.9-125			
2,4,5-T [2C]	1.68	0.10	mg/kg dry	2.720	0.0928	58.3	29-128			
2,4,5-TP	1.80	0.10	mg/kg dry	2.720	0.143	61.0	12.3-141			
2,4,5-TP [2C]	1.73	0.10	mg/kg dry	2.720	0.0397	62.2	21.8-137			
Bentazon	1.35	0.10	mg/kg dry	1.360	ND	99.5	50.1-128			
Bentazon [2C]	0.642	0.10	mg/kg dry	1.360	ND	47.2	26.5-142			
Dicamba	2.16	0.10	mg/kg dry	2.720	0.141	74.2	41.2-117			
Dicamba [2C]	2.66	0.10	mg/kg dry	2.720	0.348	84.9	31.9-118			
Picloram	1.10	0.10	mg/kg dry	1.360	ND	80.6	11.5-120			
Picloram [2C]	0.762	0.10	mg/kg dry	1.360	ND	56.0	10.2-118			
Triclopyr	1.84	0.10	mg/kg dry	2.720	ND	67.5	63.7-109			
Triclopyr [2C]	1.94	0.10	mg/kg dry	2.720	0.0814	68.3	40.7-118			
Surrogate: DCAA	18.7		mg/kg dry	27.20		68.9	60.4-128			
Surrogate: DCAA [2C]	20.1		mg/kg dry	27.20		73.8	44.7-125			

Matrix Spike (A904206-MS2)		Source: A191618-02		Prepared: 04/24/2019 Analyzed: 04/25/2019 08:13						
MCPA	4.00	0.10	mg/kg dry	5.441	0.128	71.1	71.9-119			M
MCPA [2C]	3.43	0.10	mg/kg dry	5.441	0.201	59.4	52.5-127			
Surrogate: DCAA	19.2		mg/kg dry	27.20		70.6	60.4-128			
Surrogate: DCAA [2C]	19.8		mg/kg dry	27.20		72.8	44.7-125			

Matrix Spike Dup (A904206-MSD1)		Source: A191618-02		Prepared: 04/24/2019 Analyzed: 04/25/2019 07:07						
2,4-D	1.74	0.10	mg/kg dry	2.720	0.528	44.7	68.8-106	12.5	20	M
2,4-D [2C]	1.72	0.10	mg/kg dry	2.720	0.513	44.4	36-125	4.87	20	
2,4-DB	1.42	0.10	mg/kg dry	2.720	0.107	48.2	41.2-115	4.04	20	
2,4-DB [2C]	1.56	0.10	mg/kg dry	2.720	ND	57.3	18.1-131	4.08	20	
2,4,5-T	1.63	0.10	mg/kg dry	2.720	ND	60.1	39.9-125	0.633	20	
2,4,5-T [2C]	1.59	0.10	mg/kg dry	2.720	0.0928	55.1	29-128	5.26	20	
2,4,5-TP	1.71	0.10	mg/kg dry	2.720	0.143	57.7	12.3-141	5.10	20	
2,4,5-TP [2C]	1.64	0.10	mg/kg dry	2.720	0.0397	58.8	21.8-137	5.60	20	
Bentazon	1.14	0.10	mg/kg dry	1.360	ND	84.1	50.1-128	16.8	20	
Bentazon [2C]	0.634	0.10	mg/kg dry	1.360	ND	46.6	26.5-142	1.23	20	
Dicamba	2.17	0.10	mg/kg dry	2.720	0.141	74.5	41.2-117	0.412	20	
Dicamba [2C]	2.64	0.10	mg/kg dry	2.720	0.348	84.4	31.9-118	0.485	20	
Picloram	1.19	0.10	mg/kg dry	1.360	ND	87.3	11.5-120	7.89	20	
Picloram [2C]	1.21	0.10	mg/kg dry	1.360	ND	89.1	10.2-118	45.6	20	X
Triclopyr	1.84	0.10	mg/kg dry	2.720	ND	67.5	63.7-109	0.00	20	
Triclopyr [2C]	1.80	0.10	mg/kg dry	2.720	0.0814	63.1	40.7-118	7.48	20	
Surrogate: DCAA	18.5		mg/kg dry	27.20		67.9	60.4-128			
Surrogate: DCAA [2C]	19.4		mg/kg dry	27.20		71.2	44.7-125			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

Acid Herbicides by High Performance Liquid Chromatography - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904206 - EPA 3570

Matrix Spike Dup (A904206-MSD2)

Source: A191618-02

Prepared: 04/24/2019 Analyzed: 04/25/2019 09:20

MCPA	3.96	0.10	mg/kg dry	5.441	0.128	70.5	71.9-119	0.873	20	M
MCPA [2C]	3.83	0.10	mg/kg dry	5.441	0.201	66.6	52.5-127	10.8	20	
Surrogate: DCAA	19.9		mg/kg dry	27.20		73.2	60.4-128			
Surrogate: DCAA [2C]	21.2		mg/kg dry	27.20		77.8	44.7-125			

Pace Analytical 1700 Elm Street, Suite 200 Minneapolis MN, 55414	Project: 19-01567 Freeway LF Bedrock Project Number: 10471713 Project Manager: Jennifer Anderson
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Classical Chemistry Parameters - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904217 - % Solids

Duplicate (A904217-DUP1)	Source: A191725-03		Prepared: 04/27/2019 Analyzed: 04/29/2019 08:36							
% Solids	82.0	0.00	% by Weight		80.9			1.44	20	

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Minneapolis MN, 55414

Project: 19-01567 Freeway LF Bedrock
Project Number: 10471713
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- M The matrix spike and/or matrix spike duplicate recovery was outside of the laboratory control limits.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- H The sample was held beyond the accepted holding time.
- E1 Estimated value because of quality control sample exceedances.
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

SGS

AXYS

2045 Mills Road West

TEL: (250) 655-5800

Sidney, BC, Canada V8L5X2

TOLL-FREE: 1-888-373-0881

SGS AXYS Client No.: 4173

Client Address: Pace Analytical Minnesota
1700 Elm Street SE - Suite 200
Minneapolis, MN, US, 55414

The SGS AXYS contact for these data is Sean Campbell.

BATCH SUMMARY

Batch ID: WG68018	Date: 31-May-2019
Analysis Type: Perfluorinated Organic	Matrix Type: Solid
BATCH MAKEUP	
Contract: 4173 Samples: L31038-1 FL - MW - E2 (33-35) 02-APR -2019 L31038-2 FL - MW - D2 (27-29.5) 02 - APR - 2019	Blank: WG68018-101 Reference or Spike: WG68018-102 Duplicate:
Comments: 1. Data are considered final. 2. Data are not blank corrected. Blank data should be taken into consideration when evaluating sample data. 3. Blank data should be evaluated against specifications using the same blank sample size as the size of the client samples. 4. For the FL - MW - D2 (27-29.5) 02 - APR – 2019 sample (SGS AXYS ID: L31038-2), the percent recovery for the surrogate compound 13C8-PFOA (144%) was above the upper method criteria limit (130%) and was flagged with a 'V' on the report form. As the isotope dilution method of quantification produces data that is recovery corrected, this variance from method criteria was deemed to not affect the quantification of the target analyte. Percent surrogate recoveries are used as general method performance indicator only.	

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February 2017

FQA-006 Rev. 4. 20-Sep-2013

SFTH

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 Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

CHAIN OF CUSTODY

SGS AXYS CLIENT #: 4173

REPORT TO: Company <u>Pace Analytical Services</u> Address <u>1700 Elm St. SE Suite 200</u> <u>Minneapolis MN 55414</u> Contact <u>Daniel George</u> Phone <u>612-849-6055</u> FAX _____ E-mail <u>daniel.george@pace.com</u>			INVOICE TO: Company <u>Pace Analytical Services</u> Address <u>1700 Elm St. SE Suite 200</u> <u>Minneapolis MN 55414</u> Contact <u>Daniel George</u> Phone <u>612-849-6055</u> FAX _____ E-mail <u>daniel.george@pace.com</u>			ANALYSIS REQUESTED PFC (EPA 537)			
Project Name/Number: <u>19-01567 MPLA freeway LF 2019 Bed-out</u>			Sampler's Name: Signature:						
Client Sample Identification	Matrix	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)				
<u>FL-MW-EZ (33-35)</u>	<u>solid</u>	<u>4/2/19</u>	<u>unknown</u>	<u>250 mL HDPE jar</u>	<u>L31038-1</u>				
<u>FL-MW-DZ (27.29.5)</u>	<u>solid</u>	<u>4/2/19</u>	<u>unknown</u>	<u>" "</u>	<u>-2</u>				
			<u>4/22/19</u>	<u>MW</u>					
Relinquished by (Signature) _____ Date <u>4/2/19</u> Time <u>1340</u>			Received by (Signature) <u>Rose Vizalata</u> Date <u>25 Apr 19</u> Time <u>09:30</u>			Courier _____		Waybill No. _____	
Relinquished by (Signature) _____ Date _____ Time _____			Received by (Signature) _____ Date _____ Time _____			Sample Receipt			
Remarks						Cooler			
						Temp °C			
						Custody Seal #			
						Seal Intact Y / N			
		Sample Tags		Y / N					

SGS AXYS METHOD MLA-041 Rev 09

Form 1A

CLIENT SAMPLE NO.
FL - MW - E2 (33-35) 02-APR -
2019

PERFLUORINATED ORGANICS ANALYSIS REPORT

Sample Collection:
02-Apr-2019

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4173	Project No.	19-01567
Matrix:	SOLID	Lab Sample I.D.:	L31038-1
Sample Receipt Date:	25-Apr-2019	Sample Size:	5.00 g (dry)
Extraction Date:	15-May-2019	Initial Calibration Date:	16-May-2019
Analysis Date:	16-May-2019 Time: 22:09:12	Instrument ID:	LC MS/MS
Extract Volume (uL):	4000	Column ID:	C18
Injection Volume (uL):	2	Sample Data Filename:	FC9W_191 S: 24
Dilution Factor:	N/A	Blank Data Filename:	FC9W_191 S: 23
Concentration Units:	ng/g (dry weight basis)	Cal. Ver. Data Filename:	FC9W_191 S: 18
		% Moisture:	9.90

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.100 (L)	
PFPeA	U		0.100 (L)	
PFHxA	U		0.100 (L)	
PFHpA	U		0.100 (L)	
PFOA	U		0.100 (L)	
PFNA	U		0.100 (L)	
PFDA	U		0.100 (L)	
PFUnA	U		0.100 (L)	
PFDoA	U		0.100 (L)	
PFBS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFOSA	U		0.100 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axy Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: PFC_FC_LC_PFOA_L31038-1_Form1A_FC9W_191S24_SJ2563243.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
FL - MW - E2 (33-35) 02-APR -
2019
Sample Collection:
02-Apr-2019

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4173

Project No. 19-01567

Lab Sample I.D.: L31038-1

Matrix: SOLID

Sample Size: 5.00 g (dry)

Sample Receipt Date: 25-Apr-2019

Initial Calibration Date: 16-May-2019

Extraction Date: 15-May-2019

Instrument ID: LC MS/MS

Analysis Date: 16-May-2019 Time: 22:09:12

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC9W_191 S: 24

Injection Volume (uL): 2

Blank Data Filename: FC9W_191 S: 23

Dilution Factor: N/A

Cal. Ver. Data Filename: FC9W_191 S: 18

Concentration Units: ng absolute

% Moisture: 9.90

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		12.0	11.3	94.0	2:10
13C2-PFHxA		12.0	12.5	104	3:31
13C2-PFOA		36.0	33.2	92.2	4:34
13C5-PFNA		12.0	11.0	91.4	5:21
13C2-PFDA		12.0	11.0	92.1	6:19
13C2-PFDoA		12.0	7.86	65.5	6:51
13C4-PFOS		18.0	16.5	91.5	6:27
18O2-PFHxS		18.0	17.6	97.8	4:41
13C8-PFOA		12.0	10.9	90.7	7:01

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axy Internal Use Only [XSL Template: FC-Form2.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: PFC_FC_LC_PFOA_L31038-1_Form2_FC9W_191S24_SJ2563243.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 1A

CLIENT SAMPLE NO.
FL - MW - D2 (27-29.5) 02 - APR
- 2019

PERFLUORINATED ORGANICS ANALYSIS REPORT

Sample Collection:
02-Apr-2019

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4173	Project No.	19-01567
Matrix:	SOLID	Lab Sample I.D.:	L31038-2
Sample Receipt Date:	25-Apr-2019	Sample Size:	5.08 g (dry)
Extraction Date:	15-May-2019	Initial Calibration Date:	16-May-2019
Analysis Date:	16-May-2019 Time: 22:18:38	Instrument ID:	LC MS/MS
Extract Volume (uL):	4000	Column ID:	C18
Injection Volume (uL):	2	Sample Data Filename:	FC9W_191 S: 25
Dilution Factor:	N/A	Blank Data Filename:	FC9W_191 S: 23
Concentration Units:	ng/g (dry weight basis)	Cal. Ver. Data Filename:	FC9W_191 S: 18
		% Moisture:	5.12

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.0985 (L)	
PFPeA	U		0.0985 (L)	
PFHxA	U		0.0985 (L)	
PFHpA	U		0.0985 (L)	
PFOA		0.165	0.0985 (L)	4:34
PFNA	U		0.0985 (L)	
PFDA	U		0.0985 (L)	
PFUnA	U		0.0985 (L)	
PFDoA	U		0.0985 (L)	
PFBS	U		0.197 (L)	
PFHxS	U		0.197 (L)	
PFOS	U		0.197 (L)	
PFOSA	U		0.0985 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axy Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: PFC_FC_LC_PFOA_L31038-2_Form1A_FC9W_191S25_SJ2563244.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 2

CLIENT SAMPLE NO.
FL - MW - D2 (27-29.5) 02 - APR
- 2019

PERFLUORINATED ORGANICS ANALYSIS REPORT

Sample Collection:
02-Apr-2019

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4173

Project No. 19-01567

Lab Sample I.D.: L31038-2

Matrix: SOLID

Sample Size: 5.08 g (dry)

Sample Receipt Date: 25-Apr-2019

Initial Calibration Date: 16-May-2019

Extraction Date: 15-May-2019

Instrument ID: LC MS/MS

Analysis Date: 16-May-2019 Time: 22:18:38

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC9W_191 S: 25

Injection Volume (uL): 2

Blank Data Filename: FC9W_191 S: 23

Dilution Factor: N/A

Cal. Ver. Data Filename: FC9W_191 S: 18

Concentration Units: ng absolute

% Moisture: 5.12

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		12.0	11.0	91.7	2:11
13C2-PFHxA		12.0	12.6	105	3:31
13C2-PFOA		36.0	35.1	97.5	4:34
13C5-PFNA		12.0	12.7	106	5:21
13C2-PFDA		12.0	12.8	107	6:19
13C2-PFDoA		12.0	9.39	78.3	6:51
13C4-PFOS		18.0	20.3	113	6:27
18O2-PFHxS		18.0	18.4	102	4:40
13C8-PFOA	V	12.0	17.2	144	7:01

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axy Internal Use Only [XSL Template: FC-Form2.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: PFC_FC_LC_PFOA_L31038-2_Form2_FC9W_191S25_SJ2563244.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 1A

CLIENT SAMPLE NO.

Lab Blank

Sample Collection:

N/A

PERFLUORINATED ORGANICS ANALYSIS REPORT

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4173

Project No.

N/A

Lab Sample I.D.:

WG68018-101

Matrix: AQUEOUS (SOLID METHOD)

Sample Size:

5.00 g

Sample Receipt Date: N/A

Initial Calibration Date:

16-May-2019

Extraction Date: 15-May-2019

Instrument ID:

LC MS/MS

Analysis Date: 16-May-2019 Time: 21:59:46

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC9W_191 S: 23

Injection Volume (uL): 2

Blank Data Filename:

FC9W_191 S: 23

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC9W_191 S: 18

Concentration Units: ng/g

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.100 (L)	
PFPeA	U		0.100 (L)	
PFHxA	U		0.100 (L)	
PFHpA	U		0.100 (L)	
PFOA	U		0.100 (L)	
PFNA	U		0.100 (L)	
PFDA	U		0.100 (L)	
PFUnA	U		0.100 (L)	
PFDoA	U		0.100 (L)	
PFBS	U		0.200 (L)	
PFHxS	U		0.200 (L)	
PFOS	U		0.200 (L)	
PFOSA	U		0.100 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: PFC_FC_LC_PFOA_WG68018-101_Form1A_FC9W_191S23_SJ2563241.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4173

Project No.

N/A

Lab Sample I.D.:

WG68018-101

Matrix: AQUEOUS (SOLID METHOD)

Sample Size:

5.00 g

Sample Receipt Date: N/A

Initial Calibration Date:

16-May-2019

Extraction Date: 15-May-2019

Instrument ID:

LC MS/MS

Analysis Date: 16-May-2019 Time: 21:59:46

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC9W_191 S: 23

Injection Volume (uL): 2

Blank Data Filename:

FC9W_191 S: 23

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC9W_191 S: 18

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		12.0	11.4	94.9	2:11
13C2-PFHxA		12.0	12.7	106	3:31
13C2-PFOA		36.0	31.9	88.6	4:34
13C5-PFNA		12.0	11.8	98.7	5:21
13C2-PFDA		12.0	11.6	96.3	6:18
13C2-PFDoA		12.0	9.61	80.1	6:51
13C4-PFOS		18.0	18.8	104	6:27
18O2-PFHxS		18.0	19.0	105	4:41
13C8-PFOA		12.0	11.7	97.2	7:01

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: PFC_FC_LC_PFOA_WG68018-101_Form2_FC9W_191S23_SJ2563241.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4173	Lab Sample I.D.:	WG68018-102
Matrix:	SOLID	Initial Calibration Date:	16-May-2019
Extraction Date:	15-May-2019	Instrument ID:	LC MS/MS
Analysis Date:	16-May-2019 Time: 21:40:55	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC9W_191 S: 21
Injection Volume (uL):	2	Blank Data Filename:	FC9W_191 S: 23
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC9W_191 S: 18

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		20.0	19.8	99.1	2:11
PFPeA		20.0	19.0	94.9	3:03
PFHxA		20.0	19.6	98.2	3:31
PFHpA		20.0	18.5	92.4	4:00
PFOA		20.0	20.0	100	4:34
PFNA		20.0	20.3	102	5:21
PFDA		20.0	20.6	103	6:19
PFUnA		20.0	19.5	97.5	6:42
PFDoA		20.0	20.6	103	6:51
PFBS		40.0	42.5	106	3:30
PFHxS		40.0	37.9	94.8	4:41
PFOS		40.0	40.9	102	6:27
PFOSA		20.0	18.6	93.2	7:01

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axy Internal Use Only [XSL Template: FC-Form8A.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: PFC_FC_LC_PFOA_WG68018-102_Form8A_SJ2563238.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4173	Lab Sample I.D.:	WG68018-102
Matrix:	SOLID	Initial Calibration Date:	16-May-2019
Extraction Date:	15-May-2019	Instrument ID:	LC MS/MS
Analysis Date:	16-May-2019 Time: 21:40:55	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC9W_191 S: 21
Injection Volume (uL):	2	Blank Data Filename:	FC9W_191 S: 23
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC9W_191 S: 18

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		12.0	12.1	101	2:11
13C2-PFHxA		12.0	13.2	110	3:31
13C2-PFOA		36.0	34.6	96.2	4:34
13C5-PFNA		12.0	11.8	98.2	5:21
13C2-PFDA		12.0	11.8	98.7	6:19
13C2-PFD _o A		12.0	10.1	84.1	6:51
13C4-PFOS		18.0	18.8	104	6:27
18O2-PFHxS		18.0	19.8	110	4:41
13C8-PFOA		12.0	12.5	104	7:01

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axys Internal Use Only [XSL Template: FC-Form8B.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9; Report Filename: PFC_FC_LC_PFOA_WG68018-102_Form8B_SJ2563238.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 3A

PERFLUORINATED ORGANICS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
 Initial Calibration Date: 16-May-2019

CS0 Data Filename: N/A
 CS1 Data Filename: FC9W_191 S: 6
 CS2 Data Filename: FC9W_191 S: 7
 CS3 Data Filename: FC9W_191 S: 8
 CS4 Data Filename: FC9W_191 S: 9
 CS5 Data Filename: FC9W_191 S: 10
 CS6 Data Filename: FC9W_191 S: 11
 CS7 Data Filename: FC9W_191 S: 12
 CS8 Data Filename: FC9W_191 S: 13

Instrument ID: LC MS/MS

LC Column ID: C18

COMPOUND	LAB FLAG ¹	PERCENT RECOVERY (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA			99.5	103	93.0	97.5	102	101	101	103
PFPeA			98.6	105	95.0	91.5	99.1	98.1	105	107
PFHxA			99.1	102	101	98.5	103	99.4	99.9	96.9
PFHpA			99.0	105	93.9	90.4	96.7	98.2	106	112
PFOA			95.7	112	95.3	97.8	106	99.8	95.0	98.5
PFNA			98.4	104	101	94.4	103	99.5	98.3	101
PFDA			96.4	108	104	96.6	104	101	98.4	92.2
PFUnA			94.4	111	109	106	111	100	92.2	76.5
PFDoA			99.0	104	92.2	105	107	99.7	101	92.1
PFBS			96.8	106	105	104	108	104	92.7	82.5
PFHxS			98.1	106	96.1	95.4	102	99.1	100	103
PFOS			98.3	107	92.2	93.0	104	94.0	104	108
PFOSA			98.0	106	96.5	95.5	100	95.8	102	106

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axy Internal Use Only [XSL Template: FC-Form3A.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
 Report Filename: GENERIC-SPECS_FC_LC_16-May-2019_FC9W__Form3A_GS81819.html; Workgroup: WG68018; Design ID: 1184]

**Form 3B
PERFLUORINATED ORGANICS INITIAL CALIBRATION PERCENT RECOVERIES**

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Initial Calibration Date: 16-May-2019

CS0 Data Filename: N/A
CS1 Data Filename: FC9W_191 S: 6
CS2 Data Filename: FC9W_191 S: 7
CS3 Data Filename: FC9W_191 S: 8
CS4 Data Filename: FC9W_191 S: 9
CS5 Data Filename: FC9W_191 S: 10
CS6 Data Filename: FC9W_191 S: 11
CS7 Data Filename: FC9W_191 S: 12
CS8 Data Filename: FC9W_191 S: 13

Instrument ID: LC MS/MS

LC Column ID: C18

LABELED COMPOUND	LAB FLAG ¹	PERCENT RECOVERIES (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
13C4-PFBA			102	99.7	102	101	101	105	98.2	91.2
13C2-PFHxA			116	110	108	114	106	103	82.4	61.1
13C2-PFOA			98.1	98.5	96.7	97.2	97.7	103	103	107
13C5-PFNA			105	104	98.1	106	101	105	98.8	81.9
13C2-PFDA			104	108	94.5	107	98.5	102	99.7	86.4
13C2-PFDoA			106	124	99.0	107	107	98.6	89.5	69.5
13C4-PFOS			113	116	101	114	100	104	84.9	65.8
18O2-PFHxS			110	109	109	111	105	102	87.2	66.4
13C8-PFOA			108	120	104	104	105	97.9	88.6	71.3

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axy Internal Use Only [XSL Template: FC-Form3B.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9; Report Filename: GENERIC-SPECS_FC_LC_16-May-2019_FC9W__Form3B_GS81819.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 3C

PERFLUORINATED ORGANICS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 16-May-2019

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC9W_191 S: 6

CS2 Data Filename: FC9W_191 S: 7

CS3 Data Filename: FC9W_191 S: 8

CS4 Data Filename: FC9W_191 S: 9

CS5 Data Filename: FC9W_191 S: 10

CS6 Data Filename: FC9W_191 S: 11

CS7 Data Filename: FC9W_191 S: 12

CS8 Data Filename: FC9W_191 S: 13

COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT	
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7		CS8
PFBA			2:11	2:11	2:11	2:11	2:11	2:11	2:11	2:11	2:11
PFPeA			3:03	3:03	3:03	3:03	3:03	3:02	3:03	3:03	3:03
PFHxA			3:31	3:31	3:31	3:30	3:30	3:30	3:30	3:30	3:30
PFHpA			4:00	4:00	4:00	4:00	4:00	3:59	4:00	3:59	4:00
PFOA			4:35	4:34	4:35	4:34	4:34	4:34	4:34	4:34	4:34
PFNA			5:21	5:21	5:21	5:21	5:21	5:21	5:21	5:21	5:21
PFDA			6:19	6:19	6:18	6:18	6:19	6:19	6:19	6:19	6:19
PFUnA			6:42	6:42	6:42	6:42	6:42	6:42	6:42	6:42	6:42
PFDoA			6:52	6:51	6:51	6:51	6:51	6:51	6:51	6:51	6:51
PFBS			3:30	3:30	3:30	3:30	3:30	3:30	3:30	3:30	3:30
PFHxS			4:41	4:41	4:41	4:41	4:41	4:41	4:40	4:40	4:41
PFOS			6:27	6:27	6:27	6:27	6:27	6:28	6:28	6:27	6:27
PFOSA			7:01	7:01	7:01	7:01	7:01	7:01	7:01	7:01	7:01

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axys Internal Use Only [XSL Template: FC-Form3C.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
 Report Filename: GENERIC-SPECS_FC_LC_16-May-2019_FC9W__Form3C_GS81819.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 3D

PERFLUORINATED ORGANICS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 16-May-2019

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC9W_191 S: 6

CS2 Data Filename: FC9W_191 S: 7

CS3 Data Filename: FC9W_191 S: 8

CS4 Data Filename: FC9W_191 S: 9

CS5 Data Filename: FC9W_191 S: 10

CS6 Data Filename: FC9W_191 S: 11

CS7 Data Filename: FC9W_191 S: 12

CS8 Data Filename: FC9W_191 S: 13

LABELED COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT	
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7		CS8
13C4-PFBA			2:11	2:11	2:11	2:10	2:11	2:11	2:11	2:11	2:11
13C2-PFHxA			3:31	3:30	3:30	3:30	3:30	3:30	3:30	3:30	3:30
13C2-PFOA			4:35	4:34	4:34	4:34	4:34	4:34	4:34	4:34	4:34
13C5-PFNA			5:21	5:21	5:21	5:21	5:21	5:21	5:21	5:21	5:21
13C2-PFDA			6:19	6:18	6:18	6:18	6:19	6:19	6:19	6:19	6:19
13C2-PFDoA			6:51	6:51	6:51	6:51	6:51	6:51	6:51	6:51	6:51
13C4-PFOS			6:27	6:27	6:27	6:27	6:27	6:27	6:27	6:27	6:27
18O2-PFHxS			4:41	4:41	4:41	4:41	4:41	4:40	4:40	4:40	4:41
13C8-PFOA			7:01	7:01	7:01	7:01	7:01	7:01	7:01	7:01	7:01

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axys Internal Use Only [XSL Template: FC-Form3D.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
 Report Filename: GENERIC-SPECS_FC_LC_16-May-2019_FC9W__Form3D_GS81819.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 4A

PERFLUORINATED ORGANICS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 16-May-2019

VER Data Filename: FC9W_191 S: 18

Instrument ID: LC MS/MS

Analysis Date: 16-May-2019

LC Column ID: C18

Analysis Time: 21:12:38

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		2:11	20.0	18.9	94.5
PFPeA		3:03	20.0	18.0	89.9
PFHxA		3:31	20.0	19.4	96.9
PFHpA		4:00	20.0	17.3	86.4
PFOA		4:34	20.0	19.6	98.1
PFNA		5:21	20.0	19.5	97.5
PFDA		6:19	20.0	19.2	95.9
PFUnA		6:42	20.0	20.9	104
PFDoA		6:51	20.0	20.0	99.9
PFBS		3:30	40.0	42.3	106
PFHxS		4:40	40.0	37.2	93.1
PFOS		6:27	40.0	36.4	91.0
PFOSA		7:01	20.0	19.4	96.8

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: GENERIC-SPECS_FC_LC_FC9W_191S18__Form4A_SJ2563235.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 4B

PERFLUORINATED ORGANICS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 16-May-2019

VER Data Filename: FC9W_191 S: 18

Instrument ID: LC MS/MS

Analysis Date: 16-May-2019

LC Column ID: C18

Analysis Time: 21:12:38

LABELLED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		2:11	12.0	12.2	102
13C2-PFHxA		3:31	12.0	13.7	114
13C2-PFOA		4:34	36.0	36.7	102
13C5-PFNA		5:21	12.0	12.3	103
13C2-PFDA		6:19	12.0	12.6	105
13C2-PFDoA		6:51	12.0	12.0	100
13C4-PFOS		6:27	18.0	19.8	110
18O2-PFHxS		4:40	18.0	19.4	108
13C8-PFOA		7:01	12.0	11.7	97.4

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9; Report Filename: GENERIC-SPECS_FC_LC_FC9W_191S18__Form4B_SJ2563235.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 4A

PERFLUORINATED ORGANICS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 16-May-2019

VER Data Filename: FC9W_191 S: 26

Instrument ID: LC MS/MS

Analysis Date: 16-May-2019

LC Column ID: C18

Analysis Time: 22:28:03

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		2:11	20.0	19.0	95.1
PFPeA		3:03	20.0	18.0	90.2
PFHxA		3:31	20.0	19.4	97.1
PFHpA		4:00	20.0	17.3	86.3
PFOA		4:34	20.0	19.3	96.7
PFNA		5:21	20.0	18.8	94.2
PFDA		6:19	20.0	19.1	95.7
PFUnA		6:42	20.0	16.7	83.7
PFDoA		6:51	20.0	21.0	105
PFBS		3:30	40.0	41.8	104
PFHxS		4:40	40.0	37.2	93.1
PFOS		6:28	40.0	37.7	94.4
PFOSA		7:01	20.0	20.1	100

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9;
Report Filename: GENERIC-SPECS_FC_LC_FC9W_191S26__Form4A_SJ2563245.html; Workgroup: WG68018; Design ID: 1184]

SGS AXYS METHOD MLA-041 Rev 09

Form 4B

PERFLUORINATED ORGANICS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 16-May-2019

VER Data Filename: FC9W_191 S: 26

Instrument ID: LC MS/MS

Analysis Date: 16-May-2019

LC Column ID: C18

Analysis Time: 22:28:03

LABELLED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		2:11	12.0	12.6	105
13C2-PFHxA		3:31	12.0	14.1	118
13C2-PFOA		4:34	36.0	36.0	99.9
13C5-PFNA		5:21	12.0	12.9	107
13C2-PFDA		6:19	12.0	13.4	112
13C2-PFDoA		6:51	12.0	9.98	83.1
13C4-PFOS		6:28	18.0	20.1	111
18O2-PFHxS		4:40	18.0	20.4	113
13C8-PFOA		7:01	12.0	11.9	99.0

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Andrew Porat _____

For Axys Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 31-May-2019 10:15:41; Application: XMLTransformer-1.17.9; Report Filename: GENERIC-SPECS_FC_LC_FC9W_191S26__Form4B_SJ2563245.html; Workgroup: WG68018; Design ID: 1184]

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 42

Accreditation Scope				Serum	Solids	Tissue	Urine	Water	Water, Non-Potable	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE Maine DOH ANAB DoD **	CALA Florida DOH Minnesota DOH New Jersey DEP Virginia DGS	CALA	CALA	California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE * Maine DOH Pennsylvania DEP ANAB DoD **	
BFR	BTBPE	SGS AXYS MLA-033	MLA-033		Y	Y		Y		
	DBDPE	SGS AXYS MLA-033	MLA-033		Y	Y		Y		
	HBB	SGS AXYS MLA-033	MLA-033		Y	Y		Y		
	PBEB	SGS AXYS MLA-033	MLA-033		Y	Y		Y		
Bisphenols	Bisphenol A	SGS AXYS MLA-113	MLA-113		Y			Y		
	Bisphenol AF	SGS AXYS MLA-113	MLA-113		Y			Y		
	Bisphenol B	SGS AXYS MLA-113	MLA-113		Y			Y		
	Bisphenol E	SGS AXYS MLA-113	MLA-113		Y			Y		
	Bisphenol F	SGS AXYS MLA-113	MLA-113		Y			Y		
	Bisphenol S	SGS AXYS MLA-113	MLA-113		Y			Y		
BPA and MPE	4,4'-dihydroxy-2,2-diphenylpropane (Bisphenol A) (BPA)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-(3-carboxypropyl) phthalate (MCPHP)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-2-ethylhexyl phthalate (MEHP)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-benzyl phthalate (MBzP)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-butyl phthalate (MBP) (n + iso)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-cyclohexyl phthalate (MCHP)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-ethyl phthalate (MEP)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-iso-nonyl phthalate (MINP)	SGS AXYS MLA-059	MLA-059					Y		
	Mono-methyl phthalate (MMP)	SGS AXYS MLA-059	MLA-059					Y		
HBCDD	alpha-hexabromocyclododecane (a-HBCDD)	SGS AXYS MLA-070	MLA-070	Y						
	beta-hexabromocyclododecane (b-HBCDD)	SGS AXYS MLA-070	MLA-070	Y						
	gamma-hexabromocyclododecane (g-HBCDD)	SGS AXYS MLA-070	MLA-070	Y						
OC Pesticides	"Organochlorine Pesticides" category (CA only)	EPA 608	MLA-007						Y	
		EPA 625	MLA-007						Y	
		EPA 8081	MLA-007		Y					
	"Pesticides" category (CA only)	EPA 8270	MLA-007		Y					
	2,4'-DDD	EPA 625	MLA-007							Y
		EPA 8270	MLA-007			Y				
		EPA 1699	MLA-028			Y				Y
		SGS AXYS MLA-028	MLA-028	Y	Y	Y	Y	Y	Y	Y
		SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y
	2,4'-DDE	EPA 625	MLA-007							Y
		EPA 8270	MLA-007			Y				
		EPA 1699	MLA-028			Y				Y
		SGS AXYS MLA-028	MLA-028	Y	Y	Y	Y	Y	Y	Y
		SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y
	2,4'-DDT	EPA 625	MLA-007							Y
		EPA 8270	MLA-007			Y				
		EPA 1699	MLA-028			Y				Y
		SGS AXYS MLA-028	MLA-028	Y	Y	Y	Y	Y	Y	Y
		SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y
	4,4'-DDD	EPA 625	MLA-007							Y
		EPA 8270	MLA-007			Y	Y	Y	Y	
		EPA 1699	MLA-028			Y				Y
		SGS AXYS MLA-028	MLA-028	Y	Y	Y	Y	Y	Y	Y
		SGS AXYS MLA-007	MLA-007	Y	Y	Y	Y	Y	Y	Y
4,4'-DDE	EPA 625	MLA-007							Y	
	EPA 8270	MLA-007			Y	Y	Y	Y	Y	

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 42

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum							Tissue				Water, Non-Potable																		
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB DoD **		
		EPA 1699	MLA-028				Y																										
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y							Y	Y							Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y							Y	Y													
4,4'-DDT		EPA 625	MLA-007																														
		EPA 8270	MLA-007			Y			Y	Y	Y	Y																					
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y							Y	Y							Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y							Y	Y													
		Aldrin		EPA 625	MLA-007																												
EPA 8270	MLA-007					Y			Y	Y	Y	Y																					
EPA 1699	MLA-028					Y																											
SGS AXYS MLA-028	MLA-028			Y	Y	Y						Y						Y	Y								Y						
SGS AXYS MLA-007	MLA-007			Y	Y	Y						Y						Y	Y														
Alpha-HCH		EPA 625	MLA-007																														
		EPA 8270	MLA-007			Y			Y	Y	Y	Y																					
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y						Y	Y								Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y						Y	Y														
Beta-HCH		EPA 625	MLA-007																														
		EPA 8270	MLA-007			Y			Y	Y	Y	Y																					
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y						Y	Y								Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y						Y	Y														
Chlordane, technical		EPA 625	MLA-007																														
		EPA 8270	MLA-007			Y			Y	Y	Y	Y																					
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y						Y	Y								Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y						Y	Y														
cis-Chlordane (alpha-Chlordane)		EPA 625	MLA-007																														
		EPA 8270	MLA-007			Y			Y	Y	Y	Y																					
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y						Y	Y								Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y						Y	Y														
cis-Nonachlor		EPA 625	MLA-007																														
		EPA 8270	MLA-007			Y					Y																						
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y						Y	Y								Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y						Y	Y														
Delta-HCH		EPA 608	MLA-007																														
		EPA 8081	MLA-007			Y			Y	Y	Y	Y																					
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y						Y	Y								Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y						Y	Y														
Dieldrin		EPA 608	MLA-007																														
		EPA 8081	MLA-007			Y			Y	Y	Y	Y																					
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y						Y	Y								Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y						Y	Y														
Endosulphan I		EPA 608	MLA-007																														
		EPA 8081	MLA-007			Y			Y	Y	Y	Y																					
		EPA 1699	MLA-028			Y																											
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y						Y	Y								Y						
		SGS AXYS MLA-007	MLA-007	Y	Y	Y						Y						Y	Y														
Endosulphan II		EPA 608	MLA-007																														
		EPA 8081	MLA-007			Y			Y	Y	Y	Y																					

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 42

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum									Tissue				Urine	Water	Water, Non-Potable															
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB DoD **			
		EPA 8270	MLA-021				Y																											
		SGS AXYS MLA-021	MLA-021	Y	Y									Y						Y	Y													
	Benz[a]anthracene	EPA 1625	MLA-021																			Y	Y											
		EPA 8270	MLA-021			Y			Y	Y		Y																						
		SGS AXYS MLA-021	MLA-021	Y	Y								Y							Y	Y													
	Benzo[a]pyrene	EPA 1625	MLA-021																															
		EPA 8270	MLA-021			Y			Y	Y		Y																						
		SGS AXYS MLA-021	MLA-021	Y	Y							Y								Y	Y													
	Benzo[b]fluoranthene	EPA 1625	MLA-021																															
		EPA 8270	MLA-021			Y			Y	Y		Y																						
		SGS AXYS MLA-021	MLA-021	Y	Y							Y								Y	Y													
	Benzo[e]pyrene	SGS AXYS MLA-021	MLA-021	Y								Y								Y														
	Benzo[g,h,i]perylene	EPA 1625	MLA-021																															
		EPA 8270	MLA-021			Y			Y	Y		Y																						
		SGS AXYS MLA-021	MLA-021	Y	Y							Y								Y	Y													
	Benzo[j,k]fluoranthenes	SGS AXYS MLA-021	MLA-021	Y								Y								Y														
	Benzo[k]fluoranthene	EPA 1625	MLA-021																															
		EPA 8270	MLA-021			Y			Y		Y																							
		SGS AXYS MLA-021	MLA-021			Y																												
	Biphenyl	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Acenaphthenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Benz(a)anthracenes/chrysenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Benzofluoranthenes/ Benzopyrenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Biphenyls	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Dibenzothiophene	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Fluoranthenes/Pyrenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Fluorenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Naphthalenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C1-Phenanthrenes/Anthracenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C2-Benz(a)anthracenes/Chrysenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C2-Benzofluoranthenes/ Benzopyrenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C2-Biphenyls	SGS AXYS MLA-021	MLA-021	Y																Y														
	C2-Dibenzothiophene	SGS AXYS MLA-021	MLA-021	Y																Y														
	C2-Fluoranthenes/Pyrenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C2-Fluorenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C2-Naphthalenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C2-Phenanthrenes/Anthracenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C3-Benz(a)anthracenes/Chrysenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C3-Dibenzothiophene	SGS AXYS MLA-021	MLA-021	Y																Y														
	C3-Fluoranthenes/Pyrenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C3-Fluorenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C3-Naphthalenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C3-Phenanthrenes/Anthracenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C4-Benz(a)anthracenes/Chrysenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C4-Dibenzothiophene	SGS AXYS MLA-021	MLA-021	Y																Y														
	C4-Fluoranthenes/Pyrenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C4-Fluorenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C4-Naphthalenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	C4-Phenanthrenes/Anthracenes	SGS AXYS MLA-021	MLA-021	Y																Y														
	Chrysene	EPA 1625	MLA-021																															
		EPA 8270	MLA-021			Y			Y	Y		Y																Y		Y	Y			

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 42

Accreditation Scope				Serum	Solids	Tissue	Urine	Water	Water, Non-Potable		
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE Maine DOH ANAB DoD **	CALA Florida DOH Minnesota DOH New Jersey DEP Virginia DGS	CALA	CALA	CALA California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE * Maine DOH Pennsylvania DEP ANAB DoD **		
PCB Aroclors	*PCBs* category (CA only)	EPA 625	MLA-007	Y	Y				Y		
	PCB Aroclor 1016	EPA 8270	MLA-007		Y						
		EPA 1668	MLA-010			Y			Y		
		EPA 625	MLA-007						Y		
		EPA 8270	MLA-007			Y	Y		Y		
		SGS AXYS MLA-010	MLA-010			Y			Y		
		SGS AXYS MLA-007	MLA-007		Y	Y			Y		
	PCB Aroclor 1016/1242	EPA 8270	MLA-007				Y				
		PCB Aroclor 1221	EPA 1668	MLA-010			Y		Y		
			EPA 625	MLA-007					Y		
			EPA 8270	MLA-007			Y	Y	Y		
	SGS AXYS MLA-010	MLA-010			Y			Y			
	SGS AXYS MLA-007	MLA-007		Y	Y			Y			
	PCB Aroclor 1232	EPA 1668	MLA-010			Y			Y		
		EPA 625	MLA-007						Y		
		EPA 8270	MLA-007			Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010			Y			Y		
		SGS AXYS MLA-007	MLA-007		Y	Y			Y		
		Y	Y			Y			Y		
	PCB Aroclor 1242	EPA 1668	MLA-010			Y			Y		
		EPA 625	MLA-007						Y		
		EPA 8270	MLA-007			Y	Y		Y		
		SGS AXYS MLA-010	MLA-010			Y			Y		
		SGS AXYS MLA-007	MLA-007		Y	Y			Y		
		Y	Y			Y			Y		
	PCB Aroclor 1248	EPA 1668	MLA-010			Y			Y		
		EPA 625	MLA-007						Y		
		EPA 8270	MLA-007			Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010			Y			Y		
		SGS AXYS MLA-007	MLA-007		Y	Y			Y		
		Y	Y			Y			Y		
	PCB Aroclor 1254	EPA 1668	MLA-010			Y			Y		
		EPA 625	MLA-007						Y		
EPA 8270		MLA-007			Y	Y	Y	Y			
SGS AXYS MLA-010		MLA-010			Y			Y			
SGS AXYS MLA-007		MLA-007		Y	Y			Y			
Y		Y			Y			Y			
PCB Aroclor 1260	EPA 1668	MLA-010			Y			Y			
	EPA 625	MLA-007						Y			
	EPA 8270	MLA-007			Y	Y	Y	Y			
	SGS AXYS MLA-010	MLA-010			Y			Y			
	SGS AXYS MLA-007	MLA-007		Y	Y			Y			
	Y	Y			Y			Y			
PCB Aroclor 1268	EPA 1668	MLA-010			Y			Y			
	EPA 625	MLA-007						Y			
	EPA 8270	MLA-007			Y	Y	Y	Y			
SGS AXYS MLA-010	MLA-010		Y	Y			Y				
SGS AXYS MLA-007	MLA-007		Y	Y			Y				
PCB congeners	PCB 1 2-Chlorobiphenyl	EPA 1668	MLA-010			Y	Y	Y	Y	Y	Y
		EPA 8270	MLA-007				Y				
		SGS AXYS MLA-010	MLA-010		Y	Y			Y	Y	Y
	PCB 10 2,6-Dichlorobiphenyl	EPA 1668	MLA-010			Y	Y	Y	Y	Y	Y
		SGS AXYS MLA-010	MLA-010		Y	Y			Y	Y	Y
		Y	Y			Y			Y	Y	Y
	PCB 100 2,2',4,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010			Y	Y	Y	Y	Y	Y
		EPA 8270	MLA-007				Y				
		SGS AXYS MLA-010	MLA-010		Y	Y			Y	Y	Y
	PCB 101 2,2',4,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010			Y	Y	Y	Y	Y	Y
		EPA 8270	MLA-007				Y				
		SGS AXYS MLA-010	MLA-010		Y	Y			Y	Y	Y
EPA 1668	MLA-010			Y	Y	Y	Y	Y	Y		
SGS AXYS MLA-010	MLA-010		Y	Y			Y	Y	Y		

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 42

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Tissue				Urine				Water				Water, Non-Potable						
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP
PCB 101/90/89		EPA 8270	MLA-007																											
		SGS AXYS MLA-007	MLA-007		Y								Y									Y								
PCB 102 2,2',4,5,6'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 103 2,2',4,5',6'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 104 2,2',4,6,6'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 105 2,3,3',4,4'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 105/127		EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-007	MLA-007		Y								Y										Y							
PCB 106 2,3,3',4,5-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 107 2,3,3',4',5-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 107/109		EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-007	MLA-007		Y								Y										Y							
PCB 108 2,3,3',4,5'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 109 2,3,3',4,6-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 11 3,3'-Dichlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 110 2,3,3',4',6-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
		SGS AXYS MLA-007	MLA-007		Y								Y									Y								
PCB 111 2,3,3',5,5'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 111/117		EPA 8270	MLA-007									Y																		
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
PCB 112 2,3,3',5,6-Pentachlorobiphenyl		EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
PCB 113 2,3,3',5',6-Pentachlorobiphenyl		EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
PCB 114 2,3,4,4',5-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 115 2,3,4,4',6-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 116 2,3,4,5,6-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 117 2,3,4',5,6-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y									Y								
PCB 118 2,3',4,4',5-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		

Accreditation Scope

SGS AXYS Analytical Services Ltd.
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum										Tissue				Urine		Water									
				California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	California	California	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB DoD **
		SGS AXYS MLA-010	MLA-010	Y	Y										Y					Y									
		SGS AXYS MLA-901	MLA-901	Y																									
PCB 118/106		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-007	MLA-007		Y										Y								Y						
PCB 119 2,3',4,4',6-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 12 3,4-Dichlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
		EPA 8270	MLA-007											Y															
PCB 120 2,3',4,5,5'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
		EPA 8270	MLA-007											Y															
PCB 121 2,3',4,5',6-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
		EPA 8270	MLA-007											Y															
PCB 122 2,3',4',5'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 123 2,3',4,4',5'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 124 2,3',4',5,5'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 125 2,3',4',5',6-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 126 3,3',4,4',5-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 127 3,3',4,5,5'-Pentachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
		EPA 8270	MLA-007											Y															
PCB 128 2,2',3,3',4,4'-Hexachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 129 2,2',3,3',4,5-Hexachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 13 3,4'-Dichlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
		EPA 8270	MLA-007											Y															
PCB 130 2,2',3,3',4,5'-Hexachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		EPA 8270	MLA-007											Y															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
PCB 131 2,2',3,3',4,6-Hexachlorobiphenyl		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y									Y	Y					
		EPA 8270	MLA-007											Y															
PCB 131/142		SGS AXYS MLA-007	MLA-007											Y									Y						

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum										Tissue					Urine					Water					Water, Non-Potable													
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *		Maine DOH	Pennsylvania DEP	ANAB DoD **										
PCB 132 2,2',3,3',4,6'-Hexachlorobiphenyl	EPA 1668	MLA-010																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																																				
PCB 133 2,2',3,3',5,5'-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y													Y	Y	Y	Y	Y													
PCB 134 2,2',3,3',5,6'-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																			Y		Y															
PCB 135 2,2',3,3',5,6'-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y		Y	Y	Y	Y	Y																Y	Y	Y	Y	Y										
PCB 136 2,2',3,3',6,6'-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																			Y		Y															
PCB 137 2,2',3,4,4',5-Hexachlorobiphenyl	EPA 1668	MLA-010					Y		Y	Y	Y	Y	Y																													
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																			Y		Y															
PCB 138 2,2',3,4,4',5'-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y		Y	Y	Y	Y	Y	Y																													
PCB 139 2,2',3,4,4',6-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																																				
PCB 140 2,2',3,4,4',6'-Hexachlorobiphenyl	EPA 1668	MLA-010																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																			Y		Y															
PCB 141 2,2',3,4,5,5'-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																			Y		Y															
PCB 142 2,2',3,4,5,6-Hexachlorobiphenyl	EPA 1668	MLA-010						Y		Y	Y	Y	Y																													
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																																				
PCB 143 2,2',3,4,5,6'-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																																				
PCB 144 2,2',3,4,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																																				
PCB 145 2,2',3,4,6,6'-Hexachlorobiphenyl	EPA 8270	MLA-007																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																																				
PCB 146 2,2',3,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010																																								
	SGS AXYS MLA-010	MLA-010		Y	Y	Y																																				

Accreditation ScopeSGS AXYS Analytical Services Ltd.
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum										Tissue					Water										
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH
PCB 159 2,3,3',4,5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	EPA 8270	MLA-007																											
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 16 2,2',3-Trichlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 16/32	EPA 8270	MLA-007																											
	SGS AXYS MLA-007	MLA-007		Y								Y						Y											
PCB 160 2,3,3',4,5,6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
	SGS AXYS MLA-007	MLA-007		Y								Y						Y											
PCB 161 2,3,3',4,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	EPA 8270	MLA-007																											
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 162 2,3,3',4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	EPA 8270	MLA-007																											
PCB 163 2,3,3',4',5,6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 164 2,3,3',4',5',6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 165 2,3,3',5,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	EPA 8270	MLA-007																											
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 166 2,3,4,4',5,6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	EPA 8270	MLA-007																											
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 167 2,3',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	EPA 8270	MLA-007																											
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 168 2,3',4,4',5',6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
	SGS AXYS MLA-007	MLA-007		Y								Y						Y											
PCB 169 3,3',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	EPA 8270	MLA-007																											
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 17 2,2',4-Trichlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	EPA 8270	MLA-007																											
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
PCB 170 2,2',3,3',4,4',5-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
	SGS AXYS MLA-007	MLA-007		Y																									
PCB 170/190	EPA 8270	MLA-007																											
	SGS AXYS MLA-007	MLA-007		Y								Y						Y											
	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y																		
PCB 171 2,2',3,3',4,4',6-Heptachlorobiphenyl	EPA 8270	MLA-007																											
	SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y						Y	Y										
	SGS AXYS MLA-007	MLA-007		Y								Y						Y											

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum									Tissue				Urine	Water	Water, Non-Potable											
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP
PCB 172 2,2',3,3',4,5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010					Y	Y	Y	Y	Y	Y													Y	Y	Y	Y	Y	
	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y								Y	Y								
PCB 172/192	EPA 8270	MLA-007										Y																		
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 173 2,2',3,3',4,5,6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y											Y	Y	Y	Y	Y				Y
	EPA 8270	MLA-007										Y																		
PCB 174 2,2',3,3',4,5,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y											Y	Y	Y	Y	Y				Y
	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y									Y	Y							
PCB 174/181	EPA 8270	MLA-007										Y																		
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 175 2,2',3,3',4,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		
PCB 176 2,2',3,3',4,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		
PCB 176 2,2',3,3',4,6,6'-Heptachlorobiphenyl	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y									Y	Y							
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 177 2,2',3,3',4,5',6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		
PCB 177 2,2',3,3',4,5',6'-Heptachlorobiphenyl	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y									Y	Y							
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 178 2,2',3,3',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		
PCB 178 2,2',3,3',5,5',6-Heptachlorobiphenyl	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y									Y	Y							
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 179 2,2',3,3',5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		
PCB 179 2,2',3,3',5,6,6'-Heptachlorobiphenyl	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y									Y	Y							
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 18 2,2',5-Trichlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		
PCB 18 2,2',5-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y									Y	Y							
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 180 2,2',3,4,4',5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		
PCB 180 2,2',3,4,4',5,5'-Heptachlorobiphenyl	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y									Y	Y							
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 180 2,2',3,4,4',5,5'-Heptachlorobiphenyl	SGS AXYS MLA-901	MLA-901		Y																										
	SGS AXYS MLA-007	MLA-007										Y																		
PCB 181 2,2',3,4,4',5,6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y										Y	Y						
PCB 182 2,2',3,4,4',5,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y										Y	Y						
PCB 183 2,2',3,4,4',5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		
PCB 183 2,2',3,4,4',5',6-Heptachlorobiphenyl	SGS AXYS MLA-010	MLA-010		Y	Y	Y							Y									Y	Y							
	SGS AXYS MLA-007	MLA-007			Y								Y									Y								
PCB 184 2,2',3,4,4',6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	Y			Y
	EPA 8270	MLA-007										Y																		

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum										Tissue				Urine		Water							
				California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	California DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	California	California	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP
	PCB 185 2,2',3,4,4',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010	Y	Y		Y		Y	Y	Y	Y	Y		Y			Y				Y					Y
		EPA 8270	MLA-007																								
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				
	PCB 186 2,2',3,4,5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		EPA 8270	MLA-007										Y														
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
	PCB 187 2,2',3,4',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
		SGS AXYS MLA-901	MLA-901	Y																							
	PCB 187/182	EPA 8270	MLA-007										Y														
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				Y
	PCB 188 2,2',3,4',5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		EPA 8270	MLA-007										Y														
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
	PCB 189 2,3,3',4,4',5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		EPA 8270	MLA-007										Y														
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				Y
	PCB 19 2,2',6-Trichlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		EPA 8270	MLA-007										Y														
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				Y
	PCB 190 2,3,3',4,4',5,6-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
	PCB 191 2,3,3',4,4',5',6-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		EPA 8270	MLA-007										Y														
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				Y
	PCB 192 2,3,3',4,5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
	PCB 193 2,3,3',4',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		EPA 8270	MLA-007										Y														
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				Y
	PCB 194 2,2',3,3',4,4',5,5'-Octachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		EPA 8270	MLA-007										Y														
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				Y
		SGS AXYS MLA-901	MLA-901	Y																							
	PCB 195 2,2',3,3',4,4',5,6-Octachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		EPA 8270	MLA-007										Y														
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				Y
	PCB 196 2,2',3,3',4,4',5,6'-Octachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y			Y					Y				Y
	PCB 196/203	EPA 8270	MLA-007										Y														
		SGS AXYS MLA-007	MLA-007		Y										Y			Y					Y				Y
	PCB 197 2,2',3,3',4,4',6,6'-Octachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y					Y				Y		Y	Y	Y	Y

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum								Tissue				Water				Water, Non-Potable										
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP
PCB 49/43	PCB 49/43	EPA 8270	MLA-007																											
		SGS AXYS MLA-007	MLA-007		Y								Y																	
PCB 5 2,3-Dichlorobiphenyl	PCB 5 2,3-Dichlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 50 2,2',4,6-Tetrachlorobiphenyl	PCB 50 2,2',4,6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
		SGS AXYS MLA-007	MLA-007		Y								Y											Y	Y					
PCB 51 2,2',4,6'-Tetrachlorobiphenyl	PCB 51 2,2',4,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 52 2,2',5,5'-Tetrachlorobiphenyl	PCB 52 2,2',5,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 52/73	PCB 52/73	EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-007	MLA-007		Y								Y											Y						
PCB 53 2,2',5,6'-Tetrachlorobiphenyl	PCB 53 2,2',5,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 54 2,2',6,6'-Tetrachlorobiphenyl	PCB 54 2,2',6,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 55 2,3,3',4-Tetrachlorobiphenyl	PCB 55 2,3,3',4-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 56 2,3,3',4'-Tetrachlorobiphenyl	PCB 56 2,3,3',4'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
		SGS AXYS MLA-007	MLA-007		Y								Y											Y						
PCB 57 2,3,3',5-Tetrachlorobiphenyl	PCB 57 2,3,3',5-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 58 2,3,3',5'-Tetrachlorobiphenyl	PCB 58 2,3,3',5'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 59 2,3,3',6-Tetrachlorobiphenyl	PCB 59 2,3,3',6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
		SGS AXYS MLA-007	MLA-007		Y								Y											Y						
PCB 6 2,3'-Dichlorobiphenyl	PCB 6 2,3'-Dichlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 60 2,3,4,4'-Tetrachlorobiphenyl	PCB 60 2,3,4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
		SGS AXYS MLA-007	MLA-007		Y								Y											Y						
PCB 61 2,3,4,5-Tetrachlorobiphenyl	PCB 61 2,3,4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 62 2,3,4,6-Tetrachlorobiphenyl	PCB 62 2,3,4,6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 62/65	PCB 62/65	EPA 8270	MLA-007									Y																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 63 2,3,4',5-Tetrachlorobiphenyl	PCB 63 2,3,4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y											Y	Y	Y	Y	Y		Y	
		EPA 8270	MLA-007										Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y							Y											Y	Y					
PCB 64 2,3,4',6-Tetrachlorobiphenyl	PCB 64 2,3,4',6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y										Y	Y	Y	Y	Y		Y		

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum										Tissue					Urine					Water, Non-Potable							
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB DoD **
1,2,3,4,6,7,8-HpCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017																													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y							Y	Y									Y									
1,2,3,4,7,8,9-HpCDF	EPA 1613	MLA-017												Y													Y				
	EPA 8290	MLA-017					Y		Y	Y	Y								Y	Y											
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
1,2,3,4,7,8-HxCDD	EPA 1613	MLA-017														Y															
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
1,2,3,4,7,8-HxCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
1,2,3,6,7,8-HxCDD	EPA 1613	MLA-017														Y															
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
1,2,3,6,7,8-HxCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
1,2,3,7,8-HxCDD	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
1,2,3,7,8,9-HxCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
1,2,3,7,8-PeCDD	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
1,2,3,7,8-PeCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
2,3,4,6,7,8-HxCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
2,3,4,7,8-PeCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
2,3,7,8-TCDD	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
2,3,7,8-TCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
OCDD	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
OCDF	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y	Y	Y				Y		Y	Y													
	SGS AXYS MLA-017	MLA-017	Y	Y	Y								Y	Y								Y									
Total HpCDD	EPA 1613	MLA-017																													
	EPA 8290	MLA-017					Y		Y		Y				Y		Y	Y													

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 42

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Serum										CALA	Tissue				CALA	CALA	Water, Non-Potable										
					CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **		CALA	Florida DOH	Minnesota DOH	New Jersey DEP			Virginia DGS	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP
		SGS AXYS MLA-043	MLA-043													Y																
		SGS AXYS MLA-042	MLA-042	Y													Y	Y	Y	Y												
		SGS AXYS MLA-110	MLA-110		Y	Y	Y								Y						Y	Y	Y						Y			
	Perfluoroheptanesulfonate (PFHpS)	SGS AXYS MLA-110	MLA-110		Y	Y	Y										Y	Y	Y									Y				
	Perfluoroheptanoate (PFHpA)	SGS AXYS MLA-060	MLA-060																			Y	Y	Y								
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y																								
		SGS AXYS MLA-043	MLA-043										Y	Y	Y	Y																
		SGS AXYS MLA-042	MLA-042	Y																												
		SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y		Y														Y				Y
	Perfluorohexanesulfonate (PFHxS)	SGS AXYS MLA-060	MLA-060														Y		Y	Y												
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y																				Y				Y
		SGS AXYS MLA-043	MLA-043										Y	Y	Y	Y																
		SGS AXYS MLA-042	MLA-042	Y																												
		SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y	Y										Y	Y	Y			Y				Y
	Perfluorohexanoate (PFHxA)	SGS AXYS MLA-060	MLA-060														Y		Y	Y								Y				Y
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y																								
		SGS AXYS MLA-043	MLA-043										Y	Y	Y	Y																
		SGS AXYS MLA-042	MLA-042	Y																												
		SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y	Y										Y	Y	Y			Y				Y
	Perfluorooctanesulfonate (PFOS)	SGS AXYS MLA-060	MLA-060														Y		Y	Y												
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y																								
		SGS AXYS MLA-043	MLA-043										Y	Y	Y	Y																
		SGS AXYS MLA-042	MLA-042	Y																												
		SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y	Y										Y	Y	Y			Y				Y
	Perfluorooctanesulfonamide (PFOSA), a.k.a. FOSA	SGS AXYS MLA-060	MLA-060														Y		Y	Y												
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y																								
		SGS AXYS MLA-043	MLA-043										Y	Y	Y	Y																
		SGS AXYS MLA-042	MLA-042	Y																												
		SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y	Y										Y	Y	Y			Y				Y
	Perfluorooctanoate (PFOA)	SGS AXYS MLA-060	MLA-060														Y		Y	Y												
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y																								
		SGS AXYS MLA-043	MLA-043										Y	Y	Y	Y																
		SGS AXYS MLA-042	MLA-042	Y																												
		SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y	Y										Y	Y	Y			Y				Y
	Perfluoropentanesulfonate (PFPeS)	SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y	Y										Y	Y	Y			Y				Y
	Perfluoropentanoate (PFPeA)	SGS AXYS MLA-060	MLA-060														Y		Y	Y								Y				
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y																								
		SGS AXYS MLA-043	MLA-043										Y	Y	Y	Y																
		SGS AXYS MLA-042	MLA-042	Y																												
		SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y	Y										Y	Y	Y			Y				Y
	Perfluorotetradecanoate (PFTeDA)	SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y											Y	Y	Y			Y				Y
	Perfluorotridecanoate (PFTrDA)	SGS AXYS MLA-110	MLA-110		Y	Y	Y					Y											Y	Y	Y			Y				Y
	Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-060	MLA-060														Y		Y	Y												
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y																								

Accreditation Scope

SGS AXYS Analytical Services Ltd.
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum										Tissue	Urine	Water	Water, Non-Potable													
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH					ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH
Ciprofloxacin		EPA 1694	MLA-075																											
		SGS AXYS MLA-075	MLA-075		Y																	Y								
Clarithromycin		EPA 1694	MLA-075										Y																Y	
		SGS AXYS MLA-075	MLA-075		Y																								Y	
Clinafloxacin		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y									Y																
Clonidine		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									
Cloxacillin		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Cocaine		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									
Codeine		EPA 1694	MLA-075										Y																Y	
		SGS AXYS MLA-075	MLA-075		Y																									
Cotinine		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
DEET (N,N-diethyl-m-toluamide)		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									
Dehydronifedipine		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Demeclocycline		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Desmethyldiltiazem		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									
Diazepam		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									
Digoxigenin		EPA 1694	MLA-075										Y																	Y
		SGS AXYS MLA-075	MLA-075		Y																									
Digoxin		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Diltiazem		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Diphenhydramine		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Doxycycline		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Enalapril		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Enrofloxacin		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Erythromycin		SGS AXYS MLA-075	MLA-075		Y																									Y
		SGS AXYS MLA-075	MLA-075		Y																									
Erythromycin anhydrate		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Flumequine		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Fluocinonide		SGS AXYS MLA-075	MLA-075		Y																									Y
		SGS AXYS MLA-075	MLA-075		Y																									
Fluoxetine		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Fluticasone propionate		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									
Furosemide		SGS AXYS MLA-075	MLA-075		Y																									Y
		SGS AXYS MLA-075	MLA-075		Y																									
Gemfibrozil		EPA 1694	MLA-075																											Y
		SGS AXYS MLA-075	MLA-075		Y																									
Glipizide		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									
Glyburide		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									
Hydrochlorothiazide		SGS AXYS MLA-075	MLA-075		Y																									Y
		SGS AXYS MLA-075	MLA-075		Y																									
Hydrocodone		SGS AXYS MLA-075	MLA-075		Y																									
		SGS AXYS MLA-075	MLA-075		Y																									

Accreditation Scope

SGS AXYS Analytical Services Ltd.
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum																		
				CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB DoD **	Tissue	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	Water	Water, Non-Potable
	Acetylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y								
	Acetylmethionine	SGS AXYS MLM-001	MLM-001	Y										Y								
	Alanine	SGS AXYS MLM-001	MLM-001	Y										Y								
	alpha-Aminoadipic acid	SGS AXYS MLM-001	MLM-001	Y										Y								
	Arginine	SGS AXYS MLM-001	MLM-001	Y										Y								
	Asparagine	SGS AXYS MLM-001	MLM-001	Y										Y								
	Aspartate	SGS AXYS MLM-001	MLM-001	Y										Y								
	Asymmetric dimethylarginine	SGS AXYS MLM-001	MLM-001	Y										Y								
	Butenylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y								
	Butyrylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y								
	C22:5 ISOMER 1 (tentatively all-cis-4, 8, 12, 15, 19-docosapentaenoic acid)	SGS AXYS MLM-001	MLM-001											Y								
	C22:5 ISOMER 2 (all-cis-7,10,13,16,19-docosapentaenoic acid (DPA))	SGS AXYS MLM-001	MLM-001											Y								
	C22:5 ISOMER 3 (tentatively all-cis-4, 7, 10, 13, 16-docosapentaenoic acid)	SGS AXYS MLM-001	MLM-001											Y								
	Carnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Carnosine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	chenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	cholic acid	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Citrulline	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Creatinine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Decadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	decanoic acid (capric acid)	SGS AXYS MLM-001	MLM-001											Y					Y			
	Decanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Decenylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	deoxycholic acid	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	docosahexaenoic acid (DHA)	SGS AXYS MLM-001	MLM-001											Y								
	docosatetraenoic acid (adrenic acid)	SGS AXYS MLM-001	MLM-001											Y								
	Dodecanedioylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Dodecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Dodecenylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Dopamine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	eicosapentaenoic acid (EPA)	SGS AXYS MLM-001	MLM-001											Y								
	Eicosatetraenoic acid (arachidonic acid)	SGS AXYS MLM-001	MLM-001											Y								
	eicosatrienoic acid (dihomo-γ-linolenic acid)	SGS AXYS MLM-001	MLM-001											Y								
	Glutaconylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Glutamate	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Glutamine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Glutarylarnitine (Hydroxyhexanoylcarnitine)	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Glycine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	glycochenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	glycocholic acid	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	glycodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hexadecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	hexadecanoic acid (palmitic acid)	SGS AXYS MLM-001	MLM-001											Y								
	Hexadecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	hexadecenoic acid (palmitoleic acid)	SGS AXYS MLM-001	MLM-001											Y								
	Hexadecenylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hexanoylcarnitine (Fumarylarnitine)	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hexenylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hexose (sum isomers)	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Histamine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Histidine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hydroxyhexadecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hydroxyhexadecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hydroxyhexadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hydroxybutyrylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hydroxyoctadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y					Y			
	Hydroxyproline	SGS AXYS MLM-001	MLM-001	Y										Y					Y			

Accreditation Scope

SGS AXYS Analytical Services Ltd.
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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum		Solids		Tissue		Urine	Water	Water, Non-Potable
				CALA	California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE Maine DOH ANAB DoD **	California DPH Florida DOH Minnesota DOH New Jersey DEP Virginia DGS	California DPH Florida DOH Minnesota DOH New Jersey DEP Virginia DGS Washington DE * Maine DOH Pennsylvania DEP ANAB DoD **	CALA	CALA			
	Hydroxypropionylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Hydroxy sphingomyeline C14:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Hydroxy sphingomyeline C16:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Hydroxy sphingomyeline C22:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Hydroxy sphingomyeline C22:2	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Hydroxy sphingomyeline C24:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Hydroxy tetradecenylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Hydroxy tetradecenylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Hydroxyvaleryl carnitine (Methylmalonylcarnitine)	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Isoleucine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Kynurenine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Leucine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lithocholic acid	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Lysine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C14:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C16:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C16:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C17:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C18:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C18:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C18:2	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C20:3	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C20:4	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C24:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C26:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C28:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	lysoPhosphatidylcholine acyl C28:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Methionine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Methioninesulfoxide	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Methylglutaryl carnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Nitrotyrosine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Nonacylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	octadecadienoic acid (linoleic acid)	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Octadecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	octadecanoic acid (stearic acid)	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Octadecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	octadecatrienoic acid (γ-linolenic acid)	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Octadecenylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Octanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Ornithine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phenylalanine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phenylethylamine	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C30:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C30:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C30:2	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C32:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C32:2	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C34:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C34:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C34:2	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C34:3	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C36:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C36:1	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C36:2	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C36:3	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C36:4	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C36:5	SGS AXYS MLM-001	MLM-001	Y				Y		Y		
	Phosphatidylcholine acyl-alkyl C38:0	SGS AXYS MLM-001	MLM-001	Y				Y		Y		

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 42

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Method Accreditation											
				California	Florida	Minnesota	New Jersey	New York	Virginia	Washington	Maine	Pennsylvania	ANAB DoD		
				Serum	Solids				Tissue		Urine	Water	Water, Non-Potable		
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB DoD **
	Phosphatidylcholine acyl-alkyl C38:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C38:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C38:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C38:5	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C38:6	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C40:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C40:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C40:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C40:4	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C40:5	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C40:6	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C42:0	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C42:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C42:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C42:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C42:4	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C42:5	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C44:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C44:4	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C44:5	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine acyl-alkyl C44:6	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C24:0	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C26:0	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C28:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C30:0	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C30:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C32:0	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C32:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C32:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C32:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C34:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C34:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C34:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C34:4	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C36:0	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C36:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C36:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C36:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C36:4	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C36:5	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C36:6	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C38:0	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C38:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C38:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C38:4	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C38:5	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C38:6	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C40:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C40:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C40:3	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C40:4	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C40:5	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C40:6	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C42:0	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C42:1	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C42:2	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C42:4	SGS AXYS MLM-001	MLM-001	Y	Y										
	Phosphatidylcholine diacyl C42:5	SGS AXYS MLM-001	MLM-001	Y	Y										

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 42

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum	Solids	Tissue	Urine	Water	Water, Non-Potable
				CALA	CALA California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE Maine DOH ANAB DoD **	CALA California DOH Minnesota DOH New Jersey DEP Virginia DGS	CALA California CALA	CALA California CALA	California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE * Maine DOH Pennsylvania DEP ANAB DoD **
	Phosphatidylcholine diacyl C42:6	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Pimelycarnitine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Proline	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Propionylcarnitine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Propionylcarnitine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Putrescine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sarcosine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Serine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Serotonin	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Spermidine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Spermine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C16:0	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C16:1	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C18:0	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C18:1	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C20:2	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C22:3	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C24:0	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C24:1	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C26:0	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Sphingomyeline C26:1	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Symmetric dimethylarginine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Taurine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	taurochenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	taurocholic acid	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	taurodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	tauroolithocholic acid	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	taoursodexoxycholic acid	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Tetradecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	tetradecanoic acid (myristic acid)	SGS AXYS MLM-001	MLM-001	Y		Y			
	Tetradecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Tetradecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Threonine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Tiglylcarnitine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Total dimethylarginine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Tryptophan	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Tyrosine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	ursodexoxycholic acid	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Valerylcarnitine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
	Valine	SGS AXYS MLM-001	MLM-001	Y		Y	Y		
TBBPA	Tetrabromobisphenol A	SGS AXYS MLA-079	MLA-079	Y					
TOP	Perfluorobutanesulfonate (PFBS)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorobutanoate (PFBA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorodecanesulfonate (PFDS)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorodecanoate (PFDA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorododecanesulfonate (PFDoS)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorododecanoate (PFDoA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluoroheptanesulfonate (PFHpS)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluoroheptanoate (PFHpA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorohexanesulfonate (PFHxS)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorohexanoate (PFHxA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorononanesulfonate (PFNS)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorononanoate (PFNA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorooctanesulfonate (PFOS)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorooctanoate (PFOA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluoropentanesulfonate (PFPeS)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluoropentanoate (PFPeA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluorotetradecanoate (PFTeDA)	SGS AXYS MLA-111	MLA-111		Y			Y	

Accreditation Scope SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 42				Serum	Solids	Tissue	Urine	Water	Water, Non-Potable
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	CALA	CALA	CALA	CALA
	Perfluorotridecanoate (PFTTrDA)	SGS AXYS MLA-111	MLA-111		Y			Y	
	Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-111	MLA-111		Y			Y	

Note * Analysis of pesticides and PCBs in non-potable water samples by SGS AXYS method MLA-007, with the exception of NPDES or State permitted discharges and Stormwater applications, may fall within the scope of Washington State Department of Ecology solids matrix accreditation, subject to approval of the Ecology Project Manager.

Note ** PFAS by LC-MS/MS compliant with US DoD QSM 5.1.1 table B-15

Legend

- Y Accreditation scope
- BFR Brominated flame retardants (non-PBDPE)
- BPA and mPE Bisphenol A and mono-Phthalate Esters
- HBCDD Hexabromocyclododecane
- OC Pesticides Organochlorine Pesticides
- PAH Polycyclic Aromatic Hydrocarbons
- PBDPE Polybrominated diphenylethers
- PCB Polychlorinated Biphenyls
- PCDDF Polychlorinated dibenzodioxins/furans
- PFAS Per- and Polyfluoroalkyl Substances
- PCP Pharmaceutical and Personal Care Products
- TBBPA Tetrabromobisphenol A
- TOP Total Oxidizable Precursors
- California DPH California Department of Public Health, Lab ID 2911
- Florida DOH Florida Department of Health, Lab ID E871007, (NELAC Standard)
- Pennsylvania DEP Pennsylvania Department of Environmental Protection
- Minnesota DOH Minnesota Department of Health, Lab ID 232-999-430, (NELAC Standard)
- New Jersey DEP New Jersey Department of Environmental Protection, Lab ID CANA005, (NELAC Standard)
- New York DOH New York Department of Health, Lab ID 11674, (NELAC Standard)
- Washington DE Washington Department of Ecology, Lab ID C404
- Virginia DGS Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 460224, (NELAC Standard)
- Maine DOH Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003

ANAB DoD ANSI-ASQ National Accreditation Board, certificate ADE-1861, (US DoD QSM 5.1.1 Standard)



CALA Canadian Association for Laboratory Accreditation Inc., Lab ID A2637, (ISO/IEC 17025:2005 Standard)



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 4/26/19

Client Name: QW - MPCA - Closed Landfill Assessment

Project Code: QW

Project Name: Closed Landfill Assessment

Work Order Number: 19C1235

Report To: QW - MPCA - Closed Landfill Assessment

Mark Umholtz

520 Lafayette Rd.

Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Moyer", is written over a light gray rectangular background.

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300

<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Work Order Comment: Program code is QW per B. Scruton. -CNN 3/29/19

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
Trip Blank 1	19C1235-01	QC-BLANK	03/26/19 7:00	03/28/19 10:50	2.1
Field Blank 1	19C1235-02	QC-BLANK	03/26/19 10:10	03/28/19 10:50	2.1
603281	19C1235-03	Wtr-Ground	03/26/19 11:30	03/28/19 10:50	2.1
603287	19C1235-04	Wtr-Ground	03/26/19 13:50	03/28/19 10:50	2.1
603288	19C1235-05	Wtr-Ground	03/26/19 15:30	03/28/19 10:50	2.1
603289	19C1235-06	Wtr-Ground	03/26/19 16:30	03/28/19 10:50	2.1
813766	19C1235-07	Wtr-Ground	03/27/19 10:40	03/28/19 10:50	2.1
813741	19C1235-08	Wtr-Ground	03/27/19 11:40	03/28/19 10:50	2.1
M-1	19C1235-09	Wtr-Ground	03/27/19 11:42	03/28/19 10:50	2.1
813768	19C1235-10	Wtr-Ground	03/27/19 12:40	03/28/19 10:50	2.1
813767	19C1235-11	Wtr-Ground	03/27/19 13:40	03/28/19 10:50	2.1
813765	19C1235-12	Wtr-Ground	03/27/19 15:40	03/28/19 10:50	2.1

Authorized by:

*The results in this report apply only to the samples analyzed.
 This report must not be reproduced, except in full, without the written approval of the laboratory.*



Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health



Chain-of-Custody Form rev 11/2013

Work Order Number: COC Type: Standard
 Turnaround Time: Standard COC ID: 19C1235

PROJECT/CLIENT INFO

LABORATORY

Facility Code:	MN SW-057	Program Code (MDH Lab Only):		Lab Name:	Minnesota Department of Health		
Project Name:	19-01567 MPCA Freeway Landfill 2019 MDH	Project Task Code:	PRJ07786	Address:	601 Robert Street N.		
Project Manager:	Mark Umholtz	651-757-2308		St. Paul	MN	55155	
Potential Hazard?	If yes, add information to Sampler Comments Section			Phone No:	651-201-5058		

SAMPLE DETAILS

ANALYSIS REQUESTED

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	PRESERV.	ANALYSIS REQUESTED				Lab Sample No.	#
													VOCs EPA 8260D	PFAS by MDH55	1,4 Dioxane			
Trip Blank	QC-TB	3/26/19	0700			G	NW	QC-BLANK	N		3	HCl					-01	1
Field Blank	QC-FB	3/26/19	1010			G	NW	QC-BLANK	N		5						-02	2
603281	Sample	3/26/19	1130			G	NW	Wtr-Ground	N		5						-03	3
603287	sample	3/26/19	1350			G	NW	Wtr-Ground	N		5						-04	4
603288	sample	3/26/19	1530			G	NW	Wtr-Ground	N		5						-05	5
603289	sample	3/26/19	1630			G	NW	Wtr-Ground	N		5						-06	6
813766	sample	3/27/19	1040			G	NW	Wtr-Ground	N		5						-07	7
813741	sample	3/27/19	1140			G	NW	Wtr-Ground	N		5						-08	8
M-1	QC-FR	3/27/19	1142			G	NW	Wtr-Ground	N		5						-09	9
813768	sample	3/27/19	1240			G	NW	Wtr-Ground	N		5						-10	10

Sampled By: David Anderson / Chris Pelosi
 Sampler's Signature: *David Anderson*
 Phone #: _____

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	3/28/19 / 0740	<i>[Signature]</i>	3/28/19 9:00 AM
<i>[Signature]</i>	3/28/19 1045	<i>[Signature]</i>	3/28/19 1050



Chain-of-Custody Form revision 2013.0909

Work Order Number:

COC Type: Standard

Page: ()

Turnaround Time: Standard

COC ID:

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MN SW-057

Program Code
(MDH Lab Only):

Lab Name:

Minnesota Department of Health

Project Name: 19-01567 MPCA Freeway Landfill 2019 MDH

Project Task Code: PRJ07786

Address: 601 Robert Street N.

Project Manager: Mark Umholtz

651-757-2308

St. Paul

MN

55155

Potential Hazard? If yes, add information to Sampler Comments Section

Phone No: 651-201-5058



19C1235

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
S-IVP-Integrated Vertical Profile
Sample
S-CWOP-Composite Sample

QC-FB-Field Blank Sample
QC-FR-Field Replicate Sample
QC-TB-Trip Blank Sample

LAB MATRIX CODES

DW-Drinking Water
NW-Non-potable Water
SD-Soil/Solid
WP-Wipe

AR-Air
BL-Biological Material
OT-Other
TS-Tissue

FIELD MATRIX CODES

Wtr-Ground-Groundwater
Wtr-Surf-Surface Water
QC-BLANK-Artificial Blank Water
Leachate-Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	PRESERV.	ANALYSIS REQUESTED				Lab Sample No.	#
													VOCs EPA 8260D	PFAS by MDH55	1,4 Dioxane			
813767	sample	3/27/19	1340			G	NW	WTF-Gravel	N		5	HCl	X	X	X		-11	1
813765	sample	3/27/19	1540			G	NW	WTF-Gravel	N		5	None	X	X	X		-12	2
									N									3
									N									4
									N									5
									N									6
									N									7
									N									8
									N									9
									N									10

Sampled By: David Anderson / Chris Pelasi

Sampler's Signature: David Anderson / Chris Pelasi

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	3/28/19 / 0740	J. Pelasi	3/28/19 9:00am
J. Pelasi	3/28/19	Lu B.	3/28/19 1050

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: MAR 28 '19 10:50

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # _____

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can
 None Other _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ **Evidentiary samples identified:** No Yes

Packaging, Temperature & Radiochemical Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack # 0 Gel pack # () Dry ice None
 Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 2.1 °C **IR thermometer instrument used:** B0

Samples received with evidence of freezing: No; Yes _____

Rad Chem. request received: No; Yes, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Initials of person receiving parcel: CB

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No Unknown

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Sample submission details are entered in the Environmental Laboratory LIMS.

Initials of person logging in the work order request into LIMS: B

Final Report
Case Narrative

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected by: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/2019 9:19

Except where noted in this report, no additional comments are needed for this Work Order.

FINAL REPORT

Report ID: 04262019 91928

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-01

Location ID: Trip Blank 1	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-01

Location ID: Trip Blank 1	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
4-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Acetone		<	20	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Benzene		<	0.50	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-01

Location ID: Trip Blank 1	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Methylene chloride		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Styrene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Toluene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9C0458	03/29/19 15:41	03/29/19 15:41	EPA 8260D

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-02

Location ID: Field Blank 1	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Surrogate: 4-Bromofluorobenzene		96	70-130	%	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-02

Location ID: Field Blank 1	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Acetone		<	20	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Benzene		<	0.50	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-02

Location ID: Field Blank 1	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		11	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Styrene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Toluene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9C0458	03/29/19 16:36	03/29/19 16:36	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.052	ug/L	1	B9D0172	04/11/19 09:00	04/15/19 15:03	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0105	04/05/19 17:21	04/05/19 17:21	MDH 555
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L	1	B9D0105	04/05/19 17:21	04/05/19 17:21	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-02

Location ID: Field Blank 1	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0105	04/05/19 17:21	04/05/19 17:21	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0105	04/05/19 17:21	04/05/19 17:21	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L	1	B9D0105	04/05/19 17:21	04/05/19 17:21	MDH 555
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L	1	B9D0105	04/05/19 17:21	04/05/19 17:21	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.009	0.050	ug/L	1	B9D0105	04/05/19 17:21	04/05/19 17:21	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-03

Location ID: 603281	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-03

Location ID: 603281	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Acetone		<	20	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Benzene		<	0.50	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-03

Location ID: 603281	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Styrene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Toluene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9C0458	03/29/19 18:27	03/29/19 18:27	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.051	ug/L	1	B9D0172	04/11/19 09:00	04/15/19 15:19	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0105	04/05/19 17:37	04/05/19 17:37	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.017	0.050	ug/L	1	B9D0105	04/05/19 17:37	04/05/19 17:37	MDH 555

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-03

Location ID: 603281	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0105	04/05/19 17:37	04/05/19 17:37	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0105	04/05/19 17:37	04/05/19 17:37	MDH 555
Perfluorooctanesulfonate (PFOS)	J	0.015	0.025	ug/L	1	B9D0105	04/05/19 17:37	04/05/19 17:37	MDH 555
Perfluorooctanoic acid (PFOA)	J	0.026	0.035	ug/L	1	B9D0105	04/05/19 17:37	04/05/19 17:37	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.008	0.050	ug/L	1	B9D0105	04/05/19 17:37	04/05/19 17:37	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-04

Location ID: 603287	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Surrogate: 4-Bromofluorobenzene		97	70-130	%	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-04

Location ID: 603287	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Acetone		<	20	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Benzene		<	0.50	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW
 Program Name: Closed Landfill Assessment
 Collected By: David Anderson/Chris Pelosi
 Collector ID: None

Project ID: PRJ07786
 Facility Name/ID: MN SW-057
 City: 19-01567 MPCA Freeway Landfill 2019 MDH
 Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-04

Location ID: 603287
 Field Name: None
 Sampling Point: None
 QA Type: None

Collect Date: 03/26/19
 Collect Time: 13:50
 Matrix: Wtr-Ground

Field Residual Chlorine Result: None
 Field Fluoride Result: None
 Field pH Result: None
 Field PO₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Styrene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Toluene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9C0458	03/29/19 18:55	03/29/19 18:55	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.050	ug/L	1	B9D0172	04/11/19 09:00	04/15/19 15:35	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0111	04/05/19 18:17	04/05/19 18:17	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.021	0.050	ug/L	1	B9D0111	04/05/19 18:17	04/05/19 18:17	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-04

Location ID: 603287	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0111	04/05/19 18:17	04/05/19 18:17	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0111	04/05/19 18:17	04/05/19 18:17	MDH 555
Perfluorooctanesulfonate (PFOS)	J	0.013	0.025	ug/L	1	B9D0111	04/05/19 18:17	04/05/19 18:17	MDH 555
Perfluorooctanoic acid (PFOA)	J	0.021	0.035	ug/L	1	B9D0111	04/05/19 18:17	04/05/19 18:17	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9D0111	04/05/19 18:17	04/05/19 18:17	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-05

Location ID: 603288	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		102	70-130	%	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-05

Location ID: 603288	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Acetone		<	20	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Benzene		<	0.50	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-05

Location ID: 603288	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Styrene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Toluene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9C0458	03/29/19 19:23	03/29/19 19:23	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.051	ug/L	1	B9D0172	04/11/19 09:00	04/15/19 15:51	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0111	04/05/19 18:50	04/05/19 18:50	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.014	0.050	ug/L	1	B9D0111	04/05/19 18:50	04/05/19 18:50	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-05

Location ID: 603288	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0111	04/05/19 18:50	04/05/19 18:50	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0111	04/05/19 18:50	04/05/19 18:50	MDH 555
Perfluorooctanesulfonate (PFOS)	J	0.019	0.025	ug/L	1	B9D0111	04/05/19 18:50	04/05/19 18:50	MDH 555
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L	1	B9D0111	04/05/19 18:50	04/05/19 18:50	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.010	0.050	ug/L	1	B9D0111	04/05/19 18:50	04/05/19 18:50	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-06

Location ID: 603289	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 16:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Surrogate: 4-Bromofluorobenzene		96	70-130	%	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-06

Location ID: 603289	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 16:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Acetone		<	20	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Benzene		<	0.50	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-06

Location ID: 603289	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 16:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Styrene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Toluene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D
Vinyl chloride		0.090	0.050	ug/L	1	B9C0458	03/29/19 19:51	03/29/19 19:51	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.83	0.049	ug/L	1	B9D0172	04/11/19 09:00	04/15/19 16:07	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0111	04/05/19 19:06	04/05/19 19:06	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.035	0.050	ug/L	1	B9D0111	04/05/19 19:06	04/05/19 19:06	MDH 555

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-06

Location ID: 603289	Collect Date: 03/26/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 16:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)	J	0.019	0.025	ug/L	1	B9D0111	04/05/19 19:06	04/05/19 19:06	MDH 555
Perfluorohexanoic acid (PFHxA)		0.11	0.050	ug/L	1	B9D0111	04/05/19 19:06	04/05/19 19:06	MDH 555
Perfluorooctanesulfonate (PFOS)		0.20	0.025	ug/L	1	B9D0111	04/05/19 19:06	04/05/19 19:06	MDH 555
Perfluorooctanoic acid (PFOA)		1.0	0.035	ug/L	1	B9D0111	04/05/19 19:06	04/05/19 19:06	MDH 555
Perfluoropentanoic acid (PFPeA)		0.062	0.050	ug/L	1	B9D0111	04/05/19 19:06	04/05/19 19:06	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-07

Location ID: 813766	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Surrogate: 4-Bromofluorobenzene		95	70-130	%	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-07

Location ID: 813766	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Acetone		<	20	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Benzene		0.81	0.50	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Ethyl ether		13	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-07

Location ID: 813766	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0001	04/01/19 16:54	04/01/19 16:54	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		8.3	0.050	ug/L	1	B9D0172	04/11/19 09:00	04/15/19 16:23	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0111	04/05/19 19:22	04/05/19 19:22	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.049	0.050	ug/L	1	B9D0111	04/05/19 19:22	04/05/19 19:22	MDH 555

FINAL REPORT

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-07

Location ID: 813766	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)	J	0.012	0.025	ug/L	1	B9D0111	04/05/19 19:22	04/05/19 19:22	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.023	0.050	ug/L	1	B9D0111	04/05/19 19:22	04/05/19 19:22	MDH 555
Perfluorooctanesulfonate (PFOS)		0.045	0.025	ug/L	1	B9D0111	04/05/19 19:22	04/05/19 19:22	MDH 555
Perfluorooctanoic acid (PFOA)		0.19	0.035	ug/L	1	B9D0111	04/05/19 19:22	04/05/19 19:22	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.017	0.050	ug/L	1	B9D0111	04/05/19 19:22	04/05/19 19:22	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-08

Location ID: 813741	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Surrogate: 4-Bromofluorobenzene		96	70-130	%	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-08

Location ID: 813741	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Acetone		<	20	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Ethyl ether		7.3	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-08

Location ID: 813741	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Tetrahydrofuran (THF)		13	10	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D
Vinyl chloride		5.1	0.050	ug/L	1	B9D0001	04/01/19 17:21	04/01/19 17:21	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0111	04/05/19 19:38	04/05/19 19:38	MDH 555
Perfluorobutanoic acid (PFBA)		0.10	0.050	ug/L	1	B9D0111	04/05/19 19:38	04/05/19 19:38	MDH 555
Perfluorohexanesulfonate (PFHxS)	J	0.015	0.025	ug/L	1	B9D0111	04/05/19 19:38	04/05/19 19:38	MDH 555
Perfluorohexanoic acid (PFHxA)		0.084	0.050	ug/L	1	B9D0111	04/05/19 19:38	04/05/19 19:38	MDH 555
Perfluorooctanesulfonate (PFOS)		0.082	0.025	ug/L	1	B9D0111	04/05/19 19:38	04/05/19 19:38	MDH 555
Perfluorooctanoic acid (PFOA)		0.39	0.035	ug/L	1	B9D0111	04/05/19 19:38	04/05/19 19:38	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-08

Location ID: 813741	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluoropentanoic acid (PFPeA)	J	0.025	0.050	ug/L	1	B9D0111	04/05/19 19:38	04/05/19 19:38	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19


MDH Sample Number: 19C1235-08RE1

Location ID: 813741	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	26	0.21	ug/L	4	B9D0228	04/12/19 09:22	04/25/19 11:38	EPA 522 Modified

Authorized by:  <hr/> Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health	<p><i>The results in this report apply only to the samples analyzed. This report must not be reproduced, except in full, without the written approval of the laboratory.</i></p>
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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-09

Location ID: M-1	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:42	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Surrogate: 4-Bromofluorobenzene		96	70-130	%	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		102	70-130	%	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-09

Location ID: M-1	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:42	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Acetone		<	20	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Ethyl ether		7.4	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-09

Location ID: M-1	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:42	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Tetrahydrofuran (THF)		14	10	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D
Vinyl chloride		5.2	0.050	ug/L	1	B9D0001	04/01/19 17:49	04/01/19 17:49	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.008	0.050	ug/L	1	B9D0111	04/05/19 19:55	04/05/19 19:55	MDH 555
Perfluorobutanoic acid (PFBA)		0.11	0.050	ug/L	1	B9D0111	04/05/19 19:55	04/05/19 19:55	MDH 555
Perfluorohexanesulfonate (PFHxS)	J	0.014	0.025	ug/L	1	B9D0111	04/05/19 19:55	04/05/19 19:55	MDH 555
Perfluorohexanoic acid (PFHxA)		0.061	0.050	ug/L	1	B9D0111	04/05/19 19:55	04/05/19 19:55	MDH 555
Perfluorooctanesulfonate (PFOS)		0.083	0.025	ug/L	1	B9D0111	04/05/19 19:55	04/05/19 19:55	MDH 555
Perfluorooctanoic acid (PFOA)		0.36	0.035	ug/L	1	B9D0111	04/05/19 19:55	04/05/19 19:55	MDH 555

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-09

Location ID: M-1	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:42	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluoropentanoic acid (PFPeA)	J	0.025	0.050	ug/L	1	B9D0111	04/05/19 19:55	04/05/19 19:55	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19


MDH Sample Number: 19C1235-09RE1

Location ID: M-1	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:42	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	24	0.20	ug/L	4	B9D0228	04/12/19 09:22	04/25/19 11:53	EPA 522 Modified

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-10

Location ID: 813768	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Surrogate: 4-Bromofluorobenzene		97	70-130	%	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
1,4-Dichlorobenzene		1.6	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-10

Location ID: 813768	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Acetone		<	20	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Benzene		6.7	0.50	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Chlorobenzene		4.7	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Ethyl ether		7.8	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Isopropylbenzene		5.1	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-10

Location ID: 813768	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Naphthalene		12	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
n-Butylbenzene		1.2	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
n-Propylbenzene		3.0	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
p&m-Xylene		1.2	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
sec-Butylbenzene		1.2	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D
Vinyl chloride		0.070	0.050	ug/L	1	B9D0001	04/01/19 18:17	04/01/19 18:17	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		4.2	0.050	ug/L	1	B9D0228	04/12/19 09:22	04/23/19 11:29	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0111	04/05/19 20:11	04/05/19 20:11	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.040	0.050	ug/L	1	B9D0111	04/05/19 20:11	04/05/19 20:11	MDH 555

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-10

Location ID: 813768	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		0.031	0.025	ug/L	1	B9D0111	04/05/19 20:11	04/05/19 20:11	MDH 555
Perfluorohexanoic acid (PFHxA)		0.057	0.050	ug/L	1	B9D0111	04/05/19 20:11	04/05/19 20:11	MDH 555
Perfluorooctanesulfonate (PFOS)		0.17	0.025	ug/L	1	B9D0111	04/05/19 20:11	04/05/19 20:11	MDH 555
Perfluorooctanoic acid (PFOA)		2.6	0.035	ug/L	1	B9D0111	04/05/19 20:11	04/05/19 20:11	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.012	0.050	ug/L	1	B9D0111	04/05/19 20:11	04/05/19 20:11	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-11

Location ID: 813767	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Surrogate: 4-Bromofluorobenzene		101	70-130	%	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		102	70-130	%	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D

FINAL REPORT

Report ID: 04262019 91928

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-11

Location ID: 813767	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Acetone		<	20	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Benzene		8.1	0.50	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Chlorobenzene		4.9	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Ethyl ether		13	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Isopropylbenzene		3.0	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-11

Location ID: 813767	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
n-Propylbenzene		1.9	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Tetrahydrofuran (THF)		11	10	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0001	04/01/19 18:45	04/01/19 18:45	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.011	0.050	ug/L	1	B9D0111	04/05/19 20:27	04/05/19 20:27	MDH 555
Perfluorobutanoic acid (PFBA)		0.067	0.050	ug/L	1	B9D0111	04/05/19 20:27	04/05/19 20:27	MDH 555
Perfluorohexanesulfonate (PFHxS)		0.030	0.025	ug/L	1	B9D0111	04/05/19 20:27	04/05/19 20:27	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.048	0.050	ug/L	1	B9D0111	04/05/19 20:27	04/05/19 20:27	MDH 555
Perfluorooctanesulfonate (PFOS)		0.13	0.025	ug/L	1	B9D0111	04/05/19 20:27	04/05/19 20:27	MDH 555
Perfluorooctanoic acid (PFOA)		0.57	0.035	ug/L	1	B9D0111	04/05/19 20:27	04/05/19 20:27	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-11

Location ID: 813767	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluoropentanoic acid (PFPeA)	J	0.018	0.050	ug/L	1	B9D0111	04/05/19 20:27	04/05/19 20:27	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-11RE1

Location ID: 813767	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

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1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	15	0.10	ug/L	2	B9D0228	04/12/19 09:22	04/25/19 12:09	EPA 522 Modified

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-12

Location ID: 813765	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4	F5	100	70-130	%	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Surrogate: 4-Bromofluorobenzene	F5	97	70-130	%	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3	F5	100	70-130	%	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,1,1,2-Tetrachloroethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,1,1-Trichloroethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,1,2,2-Tetrachloroethane	F5	<	0.50	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,1,2-Trichloroethane	F5	<	0.50	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,1,2-Trichlorotrifluoroethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,1-Dichloroethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,1-Dichloroethene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,1-Dichloropropene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2,3-Trichlorobenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2,3-Trichloropropane	F5	<	0.20	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2,4-Trichlorobenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2,4-Trimethylbenzene	F5	6.2	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2-Dibromoethane (EDB)	F5	<	0.50	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2-Dichlorobenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2-Dichloroethane	F5	<	0.20	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,2-Dichloropropane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,3,5-Trimethylbenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,3-Dichlorobenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,3-Dichloropropane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
1,4-Dichlorobenzene	F5	8.6	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
2,2-Dichloropropane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
2-Chlorotoluene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-12

Location ID: 813765	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Acetone	F5	<	20	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Allyl chloride	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Benzene	F5	4.0	0.50	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Bromobenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Bromochloromethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Bromodichloromethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Bromoform	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Bromomethane	F5, L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Carbon tetrachloride	F5	<	0.20	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Chlorobenzene	F5	3.0	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Chlorodibromomethane	F5	<	0.50	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Chloroethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Chloroform	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Chloromethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
cis-1,2-Dichloroethene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
cis-1,3-Dichloropropene	F5	<	0.50	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Dibromomethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Dichlorodifluoromethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Dichlorofluoromethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Ethyl ether	F5	3.6	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Ethylbenzene	F5	1.9	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Hexachlorobutadiene	F5	<	0.50	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Isopropylbenzene	F5	2.3	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Methyl ethyl ketone (MEK)	F5	<	10	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Methyl isobutyl ketone (MIBK)	F5	<	5.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Methyl tertiary butyl ether (MTBE)	F5	<	2.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-12

Location ID: 813765	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
n-Butylbenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
n-Propylbenzene	F5	1.8	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
o-Xylene	F5	2.2	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
p&m-Xylene	F5	12	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
p-Isopropyltoluene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
sec-Butylbenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Styrene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
tert-Butylbenzene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Tetrachloroethene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Tetrahydrofuran (THF)	F5	220	10	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Toluene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
trans-1,2-Dichloroethene	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
trans-1,3-Dichloropropene	F5	<	0.50	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Trichloroethene (TCE)	F5	<	0.10	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Trichlorofluoromethane	F5	<	1.0	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D
Vinyl chloride	F5	0.13	0.050	ug/L	1	B9D0001	04/01/19 19:12	04/01/19 19:12	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.027	0.050	ug/L	1	B9D0111	04/05/19 20:43	04/05/19 20:43	MDH 555
Perfluorohexanesulfonate (PFHxS)		0.29	0.025	ug/L	1	B9D0111	04/05/19 20:43	04/05/19 20:43	MDH 555
Perfluorohexanoic acid (PFHxA)		0.89	0.050	ug/L	1	B9D0111	04/05/19 20:43	04/05/19 20:43	MDH 555
Perfluorooctanesulfonate (PFOS)		0.092	0.025	ug/L	1	B9D0111	04/05/19 20:43	04/05/19 20:43	MDH 555
Perfluorooctanoic acid (PFOA)		0.41	0.035	ug/L	1	B9D0111	04/05/19 20:43	04/05/19 20:43	MDH 555
Perfluoropentanoic acid (PFPeA)		1.0	0.050	ug/L	1	B9D0111	04/05/19 20:43	04/05/19 20:43	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

MDH Sample Number: 19C1235-12RE1

Location ID: 813765	Collect Date: 03/27/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4	F5	102	70-130	%	1	B9D0019	04/02/19 15:08	04/02/19 15:08	EPA 8260D
Surrogate: 4-Bromofluorobenzene	F5	98	70-130	%	1	B9D0019	04/02/19 15:08	04/02/19 15:08	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3	F5	99	70-130	%	1	B9D0019	04/02/19 15:08	04/02/19 15:08	EPA 8260D
Naphthalene	D2, F5	62	5.0	ug/L	1	B9D0019	04/02/19 15:08	04/02/19 15:08	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	110	2.1	ug/L	40	B9D0228	04/12/19 09:22	04/24/19 18:57	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanoic acid (PFBA)	D1	7.4	0.25	ug/L	5	B9D0150	04/08/19 20:30	04/08/19 20:30	MDH 555

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Batch Summary

Samples in Batch: B9C0458 - EPA 5030B Preparation

19C1235-01 19C1235-02 19C1235-03 19C1235-04 19C1235-05 19C1235-06

Samples in Batch: B9D0001 - EPA 5030B Preparation

19C1235-07 19C1235-08 19C1235-09 19C1235-10 19C1235-11 19C1235-12

Samples in Batch: B9D0019 - EPA 5030B Preparation

19C1235-12RE1

Samples in Batch: B9D0105 - PFCs Preparation

19C1235-02 19C1235-03

Samples in Batch: B9D0111 - PFCs Preparation

19C1235-04 19C1235-05 19C1235-06 19C1235-07 19C1235-08 19C1235-09 19C1235-10
19C1235-11 19C1235-12

Samples in Batch: B9D0150 - PFCs Preparation

19C1235-12RE1

Samples in Batch: B9D0172 - 1,4 Dioxane in Water SPE

19C1235-02 19C1235-03 19C1235-04 19C1235-05 19C1235-06 19C1235-07

Samples in Batch: B9D0228 - 1,4 Dioxane in Water SPE

19C1235-08RE1 19C1235-09RE1 19C1235-10 19C1235-11RE1 19C1235-12RE1

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

Blank (B9C0458-BLK1)

Prepared: 03/29/19 15:13 Analyzed: 03/29/19 15:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		103	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		98	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

Blank (B9C0458-BLK1)

Prepared: 03/29/19 15:13 Analyzed: 03/29/19 15:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane	Z-01, L3, V4	<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

Blank (B9C0458-BLK1)

Prepared: 03/29/19 15:13 Analyzed: 03/29/19 15:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B9C0458-BS1)

Prepared: 03/29/19 13:22 Analyzed: 03/29/19 13:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		96	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		101	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10		107	70-130		
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10		95	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10		100	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		106	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		101	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		103	70-130		
1,1-Dichloropropene		10	1.0	ug/L	10		104	70-130		
1,2,3-Trichlorobenzene		10	1.0	ug/L	10		100	70-130		
1,2,3-Trichloropropane		9.7	0.20	ug/L	10		97	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10		102	70-130		
1,2,4-Trimethylbenzene		9.7	1.0	ug/L	10		97	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.4	1.0	ug/L	10		94	70-130		
1,2-Dibromoethane (EDB)		9.8	0.50	ug/L	10		98	70-130		
1,2-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10		104	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10		102	70-130		
1,3,5-Trimethylbenzene		9.8	1.0	ug/L	10		98	70-130		
1,3-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,3-Dichloropropane		9.9	1.0	ug/L	10		99	70-130		
1,4-Dichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		111	70-130		
2-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130		
4-Chlorotoluene		9.7	1.0	ug/L	10		97	70-130		
Acetone		100	20	ug/L	100		102	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

LCS (B9C0458-BS1)

Prepared: 03/29/19 13:22 Analyzed: 03/29/19 13:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		100	70-130		
Benzene		10	0.50	ug/L	10		100	70-130		
Bromobenzene		9.8	1.0	ug/L	10		98	70-130		
Bromochloromethane		10	1.0	ug/L	10		101	70-130		
Bromodichloromethane		10	1.0	ug/L	10		104	70-130		
Bromoform		10	1.0	ug/L	10		101	70-130		
Bromomethane	L3, V4, Z-01	4.9	2.0	ug/L	10		49	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		112	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		9.7	0.50	ug/L	10		97	70-130		
Chloroethane		10	1.0	ug/L	10		100	70-130		
Chloroform		10	1.0	ug/L	10		103	70-130		
Chloromethane		8.1	1.0	ug/L	10		81	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		100	70-130		
cis-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130		
Dibromomethane		10	1.0	ug/L	10		105	70-130		
Dichlorodifluoromethane		8.1	1.0	ug/L	10		81	70-130		
Dichlorofluoromethane		10	1.0	ug/L	10		105	70-130		
Ethyl ether		9.8	1.0	ug/L	10		98	70-130		
Ethylbenzene		9.9	1.0	ug/L	10		99	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10		104	70-130		
Isopropylbenzene		10	1.0	ug/L	10		100	70-130		
Methyl ethyl ketone (MEK)		51	10	ug/L	50		102	70-130		
Methyl isobutyl ketone (MIBK)		52	5.0	ug/L	50		103	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		102	70-130		
Methylene chloride		10	1.0	ug/L	10		103	70-130		
Naphthalene		9.8	1.0	ug/L	10		98	70-130		
n-Butylbenzene		11	1.0	ug/L	10		105	70-130		
n-Propylbenzene		10	1.0	ug/L	10		101	70-130		
o-Xylene		9.5	1.0	ug/L	10		95	70-130		
p&m-Xylene		10	1.0	ug/L	10		101	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10		101	70-130		
sec-Butylbenzene		10	1.0	ug/L	10		101	70-130		
Styrene		9.0	1.0	ug/L	10		90	70-130		
tert-Butylbenzene		9.7	1.0	ug/L	10		97	70-130		

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

LCS (B9C0458-BS1)

Prepared: 03/29/19 13:22 Analyzed: 03/29/19 13:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		102	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100		101	70-130		
Toluene		9.7	1.0	ug/L	10		97	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		100	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130		
Trichloroethene (TCE)		9.9	0.10	ug/L	10		99	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10		106	70-130		
Vinyl chloride		9.0	0.050	ug/L	10		90	70-130		

LCS Dup (B9C0458-BSD1)

Prepared: 03/29/19 13:50 Analyzed: 03/29/19 13:50

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		95	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.8	1.0	ug/L	10		98	70-130	4	30
1,1,1-Trichloroethane		10	1.0	ug/L	10		102	70-130	4	30
1,1,2,2-Tetrachloroethane		9.2	0.50	ug/L	10		92	70-130	3	30
1,1,2-Trichloroethane		9.8	0.50	ug/L	10		98	70-130	1	30
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		105	70-130	0.9	30
1,1-Dichloroethane		9.8	1.0	ug/L	10		98	70-130	2	30
1,1-Dichloroethene		10	1.0	ug/L	10		100	70-130	3	30
1,1-Dichloropropene		10	1.0	ug/L	10		100	70-130	4	30
1,2,3-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
1,2,3-Trichloropropane		9.4	0.20	ug/L	10		94	70-130	3	30
1,2,4-Trichlorobenzene		9.9	1.0	ug/L	10		99	70-130	3	30
1,2,4-Trimethylbenzene		9.4	1.0	ug/L	10		94	70-130	3	30
1,2-Dibromo-3-chloropropane (DBCP)		9.5	1.0	ug/L	10		95	70-130	0.9	30
1,2-Dibromoethane (EDB)		9.5	0.50	ug/L	10		95	70-130	3	30
1,2-Dichlorobenzene		9.5	1.0	ug/L	10		95	70-130	2	30
1,2-Dichloroethane		10	0.20	ug/L	10		100	70-130	4	30
1,2-Dichloropropane		10	1.0	ug/L	10		101	70-130	0.4	30
1,3,5-Trimethylbenzene		9.4	1.0	ug/L	10		94	70-130	5	30
1,3-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130	0.6	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

LCS Dup (B9C0458-BSD1)

Prepared: 03/29/19 13:50 Analyzed: 03/29/19 13:50

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		9.7	1.0	ug/L	10		97	70-130	2	30
1,4-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	3	30
2,2-Dichloropropane		11	1.0	ug/L	10		107	70-130	3	30
2-Chlorotoluene		9.5	1.0	ug/L	10		95	70-130	1	30
4-Chlorotoluene		9.4	1.0	ug/L	10		94	70-130	3	30
Acetone		99	20	ug/L	100		99	70-130	3	30
Allyl chloride		9.6	1.0	ug/L	10		96	70-130	3	30
Benzene		9.8	0.50	ug/L	10		98	70-130	2	30
Bromobenzene		9.6	1.0	ug/L	10		96	70-130	3	30
Bromochloromethane		10	1.0	ug/L	10		101	70-130	0.5	30
Bromodichloromethane		10	1.0	ug/L	10		103	70-130	0.7	30
Bromoform		9.3	1.0	ug/L	10		93	70-130	8	30
Bromomethane	L3, V4, Z-01	5.7	2.0	ug/L	10		57	70-130	15	30
Carbon tetrachloride		11	0.20	ug/L	10		108	70-130	3	30
Chlorobenzene		9.7	1.0	ug/L	10		97	70-130	3	30
Chlorodibromomethane		9.5	0.50	ug/L	10		95	70-130	2	30
Chloroethane		9.6	1.0	ug/L	10		96	70-130	4	30
Chloroform		10	1.0	ug/L	10		101	70-130	2	30
Chloromethane		7.5	1.0	ug/L	10		75	70-130	8	30
cis-1,2-Dichloroethene		9.8	1.0	ug/L	10		98	70-130	2	30
cis-1,3-Dichloropropene		9.5	0.50	ug/L	10		95	70-130	4	30
Dibromomethane		11	1.0	ug/L	10		106	70-130	1	30
Dichlorodifluoromethane		7.9	1.0	ug/L	10		79	70-130	3	30
Dichlorofluoromethane		10	1.0	ug/L	10		103	70-130	2	30
Ethyl ether		9.8	1.0	ug/L	10		98	70-130	0.7	30
Ethylbenzene		9.6	1.0	ug/L	10		96	70-130	3	30
Hexachlorobutadiene		10	0.50	ug/L	10		102	70-130	2	30
Isopropylbenzene		9.8	1.0	ug/L	10		98	70-130	3	30
Methyl ethyl ketone (MEK)		50	10	ug/L	50		100	70-130	2	30
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130	3	30
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		102	70-130	0.4	30
Methylene chloride		9.9	1.0	ug/L	10		99	70-130	4	30
Naphthalene		9.6	1.0	ug/L	10		96	70-130	2	30
n-Butylbenzene		10	1.0	ug/L	10		102	70-130	3	30
n-Propylbenzene		9.8	1.0	ug/L	10		98	70-130	3	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

LCS Dup (B9C0458-BSD1)

Prepared: 03/29/19 13:50 Analyzed: 03/29/19 13:50

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		9.4	1.0	ug/L	10		94	70-130	0.7	30
p&m-Xylene		9.6	1.0	ug/L	10		96	70-130	5	30
p-Isopropyltoluene		9.7	1.0	ug/L	10		97	70-130	4	30
sec-Butylbenzene		9.7	1.0	ug/L	10		97	70-130	4	30
Styrene		8.8	1.0	ug/L	10		88	70-130	2	30
tert-Butylbenzene		9.5	1.0	ug/L	10		95	70-130	2	30
Tetrachloroethene		10	1.0	ug/L	10		100	70-130	3	30
Tetrahydrofuran (THF)		100	10	ug/L	100		100	70-130	0.7	30
Toluene		9.5	1.0	ug/L	10		95	70-130	3	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		100	70-130	0.1	30
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130	3	30
Trichloroethene (TCE)		9.7	0.10	ug/L	10		97	70-130	2	30
Trichlorofluoromethane		10	1.0	ug/L	10		102	70-130	4	30
Vinyl chloride		8.6	0.050	ug/L	10		86	70-130	4	30

Duplicate (B9C0458-DUP1)

Source: 19C1238-02

Prepared: 03/29/19 18:00 Analyzed: 03/29/19 18:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		97	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

Duplicate (B9C0458-DUP1)

Source: 19C1238-02

Prepared: 03/29/19 18:00 Analyzed: 03/29/19 18:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		<	1.0	ug/L		<				30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		<	0.50	ug/L		<				30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane	L3, V4, Z-01	<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		<	1.0	ug/L		<				30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		0.39	1.0	ug/L		<				30
cis-1,2-Dichloroethene		<	1.0	ug/L		<				30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		<	1.0	ug/L		<				30
Ethyl ether		<	1.0	ug/L		<				30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

Duplicate (B9C0458-DUP1)		Source: 19C1238-02		Prepared: 03/29/19 18:00		Analyzed: 03/29/19 18:00		RPD	RPD Limit
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<			30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<			30
Methylene chloride		<	1.0	ug/L		<			30
Naphthalene		<	1.0	ug/L		<			30
n-Butylbenzene		<	1.0	ug/L		<			30
n-Propylbenzene		<	1.0	ug/L		<			30
o-Xylene		<	1.0	ug/L		<			30
p&m-Xylene		<	1.0	ug/L		<			30
p-Isopropyltoluene		<	1.0	ug/L		<			30
sec-Butylbenzene		<	1.0	ug/L		<			30
Styrene		<	1.0	ug/L		<			30
tert-Butylbenzene		<	1.0	ug/L		<			30
Tetrachloroethene		<	1.0	ug/L		<			30
Tetrahydrofuran (THF)		<	10	ug/L		<			30
Toluene		<	1.0	ug/L		<			30
trans-1,2-Dichloroethene		<	1.0	ug/L		<			30
trans-1,3-Dichloropropene		<	0.50	ug/L		<			30
Trichloroethene (TCE)		0.75	0.10	ug/L		0.74			1 30
Trichlorofluoromethane		<	1.0	ug/L		<			30
Vinyl chloride		<	0.050	ug/L		<			30

Matrix Spike (B9C0458-MS1)		Source: 19C1238-01		Prepared: 03/29/19 14:17		Analyzed: 03/29/19 14:17		RPD	RPD Limit
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10				
Surrogate: 4-Bromofluorobenzene		95	70-130	%	10				
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10				
1,1,1,2-Tetrachloroethane		11	1.0	ug/L	10	<	105	70-130	
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	111	70-130	
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10	<	95	70-130	
1,1,2-Trichloroethane		10	0.50	ug/L	10	<	101	70-130	
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10	<	112	70-130	
1,1-Dichloroethane		11	1.0	ug/L	10	<	106	70-130	
1,1-Dichloroethene		11	1.0	ug/L	10	<	109	70-130	
1,1-Dichloropropene		11	1.0	ug/L	10	<	108	70-130	

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

Matrix Spike (B9C0458-MS1)		Source: 19C1238-01		Prepared: 03/29/19 14:17		Analyzed: 03/29/19 14:17		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	103	70-130		
1,2,3-Trichloropropane		9.6	0.20	ug/L	10	<	96	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10	<	100	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		8.9	1.0	ug/L	10	<	89	70-130		
1,2-Dibromoethane (EDB)		9.7	0.50	ug/L	10	<	97	70-130		
1,2-Dichlorobenzene		9.8	1.0	ug/L	10	<	98	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10	<	101	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10	<	104	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10	<	101	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10	<	100	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	116	70-130		
2-Chlorotoluene		10	1.0	ug/L	10	<	101	70-130		
4-Chlorotoluene		10	1.0	ug/L	10	<	100	70-130		
Acetone		94	20	ug/L	100	<	94	70-130		
Allyl chloride		10	1.0	ug/L	10	<	101	70-130		
Benzene		10	0.50	ug/L	10	<	103	70-130		
Bromobenzene		9.9	1.0	ug/L	10	<	99	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	106	70-130		
Bromodichloromethane		10	1.0	ug/L	10	<	104	70-130		
Bromoform		9.7	1.0	ug/L	10	<	97	70-130		
Bromomethane	L3, V4, Z-01a	6.7	2.0	ug/L	10	<	67	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	118	70-130		
Chlorobenzene		10	1.0	ug/L	10	<	103	70-130		
Chlorodibromomethane		9.7	0.50	ug/L	10	<	97	70-130		
Chloroethane		10	1.0	ug/L	10	<	104	70-130		
Chloroform		11	1.0	ug/L	10	<	106	70-130		
Chloromethane		8.5	1.0	ug/L	10	<	85	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10	<	105	70-130		
cis-1,3-Dichloropropene		9.8	0.50	ug/L	10	<	98	70-130		
Dibromomethane		10	1.0	ug/L	10	<	101	70-130		
Dichlorodifluoromethane		8.7	1.0	ug/L	10	<	87	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10	<	111	70-130		

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9C0458 - EPA 5030B Preparation

Matrix Spike (B9C0458-MS1)		Source: 19C1238-01		Prepared: 03/29/19 14:17		Analyzed: 03/29/19 14:17		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ethyl ether		11	1.0	ug/L	10	1.2	94	70-130		
Ethylbenzene		10	1.0	ug/L	10	<	103	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10	<	108	70-130		
Isopropylbenzene		10	1.0	ug/L	10	<	104	70-130		
Methyl ethyl ketone (MEK)		48	10	ug/L	50	<	96	70-130		
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50	<	100	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10	<	101	70-130		
Methylene chloride		10	1.0	ug/L	10	<	103	70-130		
Naphthalene		9.7	1.0	ug/L	10	<	97	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	110	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	105	70-130		
o-Xylene		9.9	1.0	ug/L	10	<	99	70-130		
p&m-Xylene		10	1.0	ug/L	10	<	104	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10	<	106	70-130		
sec-Butylbenzene		11	1.0	ug/L	10	<	106	70-130		
Styrene		9.7	1.0	ug/L	10	<	97	70-130		
tert-Butylbenzene		10	1.0	ug/L	10	<	102	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	108	70-130		
Tetrahydrofuran (THF)		94	10	ug/L	100	<	94	70-130		
Toluene		10	1.0	ug/L	10	<	101	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	106	70-130		
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10	<	98	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	0.25	104	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10	<	113	70-130		
Vinyl chloride		9.9	0.050	ug/L	10	<	99	70-130		

Batch B9D0001 - EPA 5030B Preparation

Blank (B9D0001-BLK1)		Prepared: 04/01/19 14:35		Analyzed: 04/01/19 14:35		RPD	RPD Limit			
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

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Batch B9D0001 - EPA 5030B Preparation

Blank (B9D0001-BLK1)

Prepared: 04/01/19 14:35 Analyzed: 04/01/19 14:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						
Bromomethane	L3, V4, Z-01	<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

Blank (B9D0001-BLK1)

Prepared: 04/01/19 14:35 Analyzed: 04/01/19 14:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

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Batch B9D0001 - EPA 5030B Preparation

LCS (B9D0001-BS1)

Prepared: 04/01/19 12:44 Analyzed: 04/01/19 12:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		95	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		102	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		102	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10		107	70-130		
1,1,2,2-Tetrachloroethane		9.7	0.50	ug/L	10		97	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10		102	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		109	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		104	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		107	70-130		
1,2,3-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,3-Trichloropropane		9.7	0.20	ug/L	10		97	70-130		
1,2,4-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,4-Trimethylbenzene		9.9	1.0	ug/L	10		99	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.8	1.0	ug/L	10		98	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		100	70-130		
1,2-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10		106	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10		104	70-130		
1,3,5-Trimethylbenzene		9.7	1.0	ug/L	10		97	70-130		
1,3-Dichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
1,3-Dichloropropane		9.8	1.0	ug/L	10		98	70-130		
1,4-Dichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		115	70-130		
2-Chlorotoluene		9.8	1.0	ug/L	10		98	70-130		
4-Chlorotoluene		9.8	1.0	ug/L	10		98	70-130		
Acetone		100	20	ug/L	100		101	70-130		
Allyl chloride		10	1.0	ug/L	10		103	70-130		
Benzene		10	0.50	ug/L	10		101	70-130		
Bromobenzene		10	1.0	ug/L	10		100	70-130		
Bromochloromethane		11	1.0	ug/L	10		107	70-130		
Bromodichloromethane		11	1.0	ug/L	10		108	70-130		
Bromoform		9.5	1.0	ug/L	10		95	70-130		

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

LCS (B9D0001-BS1)

Prepared: 04/01/19 12:44 Analyzed: 04/01/19 12:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane	L3, V4, Z-01	5.5	2.0	ug/L	10		55	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		114	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		9.9	0.50	ug/L	10		99	70-130		
Chloroethane		10	1.0	ug/L	10		104	70-130		
Chloroform		11	1.0	ug/L	10		105	70-130		
Chloromethane		8.1	1.0	ug/L	10		81	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130		
Dibromomethane		11	1.0	ug/L	10		106	70-130		
Dichlorodifluoromethane		8.2	1.0	ug/L	10		82	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		109	70-130		
Ethyl ether		9.9	1.0	ug/L	10		99	70-130		
Ethylbenzene		10	1.0	ug/L	10		100	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10		104	70-130		
Isopropylbenzene		10	1.0	ug/L	10		101	70-130		
Methyl ethyl ketone (MEK)		51	10	ug/L	50		102	70-130		
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50		101	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		105	70-130		
Methylene chloride		11	1.0	ug/L	10		105	70-130		
Naphthalene		9.7	1.0	ug/L	10		97	70-130		
n-Butylbenzene		11	1.0	ug/L	10		107	70-130		
n-Propylbenzene		10	1.0	ug/L	10		101	70-130		
o-Xylene		9.6	1.0	ug/L	10		96	70-130		
p&m-Xylene		10	1.0	ug/L	10		100	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10		100	70-130		
sec-Butylbenzene		10	1.0	ug/L	10		101	70-130		
Styrene		9.6	1.0	ug/L	10		96	70-130		
tert-Butylbenzene		9.9	1.0	ug/L	10		99	70-130		
Tetrachloroethene		10	1.0	ug/L	10		102	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100		101	70-130		
Toluene		9.7	1.0	ug/L	10		97	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

LCS (B9D0001-BS1)

Prepared: 04/01/19 12:44 Analyzed: 04/01/19 12:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		11	1.0	ug/L	10		108	70-130		
Vinyl chloride		9.5	0.050	ug/L	10		95	70-130		

LCS Dup (B9D0001-BS1)

Prepared: 04/01/19 13:12 Analyzed: 04/01/19 13:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		97	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		101	70-130	1	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	1	30
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130	3	30
1,1,2-Trichloroethane		9.7	0.50	ug/L	10		97	70-130	5	30
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		104	70-130	4	30
1,1-Dichloroethane		10	1.0	ug/L	10		101	70-130	3	30
1,1-Dichloroethene		10	1.0	ug/L	10		102	70-130	2	30
1,1-Dichloropropene		11	1.0	ug/L	10		105	70-130	1	30
1,2,3-Trichlorobenzene		10	1.0	ug/L	10		100	70-130	2	30
1,2,3-Trichloropropane		9.4	0.20	ug/L	10		94	70-130	3	30
1,2,4-Trichlorobenzene		9.9	1.0	ug/L	10		99	70-130	0.6	30
1,2,4-Trimethylbenzene		9.6	1.0	ug/L	10		96	70-130	3	30
1,2-Dibromo-3-chloropropane (DBCP)		9.3	1.0	ug/L	10		93	70-130	5	30
1,2-Dibromoethane (EDB)		9.4	0.50	ug/L	10		94	70-130	5	30
1,2-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	2	30
1,2-Dichloroethane		10	0.20	ug/L	10		103	70-130	3	30
1,2-Dichloropropane		10	1.0	ug/L	10		103	70-130	2	30
1,3,5-Trimethylbenzene		9.4	1.0	ug/L	10		94	70-130	3	30
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	3	30
1,3-Dichloropropane		9.8	1.0	ug/L	10		98	70-130	0.2	30
1,4-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
2,2-Dichloropropane		11	1.0	ug/L	10		109	70-130	5	30
2-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130	2	30
4-Chlorotoluene		9.5	1.0	ug/L	10		95	70-130	3	30
Acetone		100	20	ug/L	100		101	70-130	0.4	30

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

LCS Dup (B9D0001-BSD1)

Prepared: 04/01/19 13:12 Analyzed: 04/01/19 13:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		9.6	1.0	ug/L	10		96	70-130	7	30
Benzene		10	0.50	ug/L	10		100	70-130	2	30
Bromobenzene		9.5	1.0	ug/L	10		95	70-130	5	30
Bromochloromethane		10	1.0	ug/L	10		102	70-130	6	30
Bromodichloromethane		10	1.0	ug/L	10		103	70-130	5	30
Bromoform		9.2	1.0	ug/L	10		92	70-130	3	30
Bromomethane	L3, V4, Z-01	5.8	2.0	ug/L	10		58	70-130	4	30
Carbon tetrachloride		11	0.20	ug/L	10		111	70-130	3	30
Chlorobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
Chlorodibromomethane		9.4	0.50	ug/L	10		94	70-130	5	30
Chloroethane		10	1.0	ug/L	10		101	70-130	4	30
Chloroform		10	1.0	ug/L	10		102	70-130	3	30
Chloromethane		7.8	1.0	ug/L	10		78	70-130	3	30
cis-1,2-Dichloroethene		9.9	1.0	ug/L	10		99	70-130	5	30
cis-1,3-Dichloropropene		9.6	0.50	ug/L	10		96	70-130	5	30
Dibromomethane		10	1.0	ug/L	10		105	70-130	1	30
Dichlorodifluoromethane		7.9	1.0	ug/L	10		79	70-130	4	30
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130	2	30
Ethyl ether		9.8	1.0	ug/L	10		98	70-130	1	30
Ethylbenzene		9.5	1.0	ug/L	10		95	70-130	6	30
Hexachlorobutadiene		10	0.50	ug/L	10		100	70-130	4	30
Isopropylbenzene		9.6	1.0	ug/L	10		96	70-130	5	30
Methyl ethyl ketone (MEK)		51	10	ug/L	50		102	70-130	0.5	30
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130	1	30
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		101	70-130	3	30
Methylene chloride		10	1.0	ug/L	10		102	70-130	3	30
Naphthalene		9.6	1.0	ug/L	10		96	70-130	2	30
n-Butylbenzene		10	1.0	ug/L	10		103	70-130	3	30
n-Propylbenzene		9.9	1.0	ug/L	10		99	70-130	2	30
o-Xylene		9.4	1.0	ug/L	10		94	70-130	2	30
p&m-Xylene		9.7	1.0	ug/L	10		97	70-130	4	30
p-Isopropyltoluene		9.9	1.0	ug/L	10		99	70-130	1	30
sec-Butylbenzene		9.8	1.0	ug/L	10		98	70-130	3	30
Styrene		9.0	1.0	ug/L	10		90	70-130	6	30
tert-Butylbenzene		9.7	1.0	ug/L	10		97	70-130	2	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

LCS Dup (B9D0001-BSD1)

Prepared: 04/01/19 13:12 Analyzed: 04/01/19 13:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		9.8	1.0	ug/L	10		98	70-130	3	30
Tetrahydrofuran (THF)		100	10	ug/L	100		102	70-130	0.6	30
Toluene		9.4	1.0	ug/L	10		94	70-130	3	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130	2	30
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130	3	30
Trichloroethene (TCE)		9.8	0.10	ug/L	10		98	70-130	3	30
Trichlorofluoromethane		10	1.0	ug/L	10		103	70-130	4	30
Vinyl chloride		9.1	0.050	ug/L	10		91	70-130	5	30

Duplicate (B9D0001-DUP1)

Source: 19C1238-15

Prepared: 04/01/19 16:26 Analyzed: 04/01/19 16:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		104	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		98	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		0.60	1.0	ug/L		<			3	30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

Duplicate (B9D0001-DUP1)

Source: 19C1238-15

Prepared: 04/01/19 16:26 Analyzed: 04/01/19 16:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		0.26	1.0	ug/L		<			8	30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		0.21	0.50	ug/L		<			5	30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane	L3, V4, Z-01	<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		0.28	1.0	ug/L		<			15	30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		<	1.0	ug/L		<				30
cis-1,2-Dichloroethene		0.67	1.0	ug/L		<			1	30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		0.61	1.0	ug/L		<			6	30
Ethyl ether		47	1.0	ug/L		47			0.4	30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30

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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

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Batch B9D0001 - EPA 5030B Preparation

Duplicate (B9D0001-DUP1) Source: 19C1238-15 Prepared: 04/01/19 16:26 Analyzed: 04/01/19 16:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		0.91	1.0	ug/L		1.0			9	30
Tetrahydrofuran (THF)		<	10	ug/L		<				30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		0.56	0.10	ug/L		0.56			0	30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		0.090	0.050	ug/L		0.090			0	30

Matrix Spike (B9D0001-MS1) Source: 19C1238-13 Prepared: 04/01/19 13:40 Analyzed: 04/01/19 13:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		95	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10	<	105	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	114	70-130		
1,1,2,2-Tetrachloroethane		9.6	0.50	ug/L	10	<	96	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10	<	104	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10	<	118	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	109	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	112	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10	<	112	70-130		
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,3-Trichloropropane		9.7	0.20	ug/L	10	<	97	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10	<	103	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.2	1.0	ug/L	10	<	92	70-130		

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Final Report
 Quality Control

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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

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Batch B9D0001 - EPA 5030B Preparation

Matrix Spike (B9D0001-MS1)

Source: 19C1238-13

Prepared: 04/01/19 13:40 Analyzed: 04/01/19 13:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	100	70-130		
1,2-Dichlorobenzene		10	1.0	ug/L	10	<	101	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10	<	107	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10	<	108	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	101	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10	<	102	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10	<	103	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	122	70-130		
2-Chlorotoluene		10	1.0	ug/L	10	<	103	70-130		
4-Chlorotoluene		10	1.0	ug/L	10	<	102	70-130		
Acetone		96	20	ug/L	100	<	96	70-130		
Allyl chloride		11	1.0	ug/L	10	<	107	70-130		
Benzene		11	0.50	ug/L	10	<	107	70-130		
Bromobenzene		10	1.0	ug/L	10	<	100	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	109	70-130		
Bromodichloromethane		11	1.0	ug/L	10	<	109	70-130		
Bromoform		9.5	1.0	ug/L	10	<	95	70-130		
Bromomethane	L3, V4, Z-01a	6.6	2.0	ug/L	10	<	66	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	122	70-130		
Chlorobenzene		10	1.0	ug/L	10	<	105	70-130		
Chlorodibromomethane		9.8	0.50	ug/L	10	<	98	70-130		
Chloroethane		11	1.0	ug/L	10	<	111	70-130		
Chloroform		11	1.0	ug/L	10	<	112	70-130		
Chloromethane		8.5	1.0	ug/L	10	<	85	70-130		
cis-1,2-Dichloroethene		11	1.0	ug/L	10	<	107	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10	<	103	70-130		
Dibromomethane		11	1.0	ug/L	10	<	109	70-130		
Dichlorodifluoromethane		9.1	1.0	ug/L	10	<	91	70-130		
Dichlorofluoromethane		12	1.0	ug/L	10	<	116	70-130		
Ethyl ether		10	1.0	ug/L	10	<	101	70-130		
Ethylbenzene		10	1.0	ug/L	10	<	105	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10	<	110	70-130		
Isopropylbenzene		11	1.0	ug/L	10	<	107	70-130		
Methyl ethyl ketone (MEK)		48	10	ug/L	50	<	96	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

Matrix Spike (B9D0001-MS1)		Source: 19C1238-13		Prepared: 04/01/19 13:40 Analyzed: 04/01/19 13:40						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50	<	99	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10	<	105	70-130		
Methylene chloride		11	1.0	ug/L	10	<	108	70-130		
Naphthalene		9.5	1.0	ug/L	10	<	95	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	112	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	108	70-130		
o-Xylene		10	1.0	ug/L	10	<	100	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	105	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10	<	106	70-130		
sec-Butylbenzene		11	1.0	ug/L	10	<	108	70-130		
Styrene		9.8	1.0	ug/L	10	<	98	70-130		
tert-Butylbenzene		10	1.0	ug/L	10	<	104	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	108	70-130		
Tetrahydrofuran (THF)		96	10	ug/L	100	<	96	70-130		
Toluene		10	1.0	ug/L	10	<	104	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	110	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10	<	104	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	108	70-130		
Trichlorofluoromethane		12	1.0	ug/L	10	<	117	70-130		
Vinyl chloride		10	0.050	ug/L	10	<	104	70-130		

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)		Prepared: 04/02/19 12:49 Analyzed: 04/02/19 12:49								
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)

Prepared: 04/02/19 12:49 Analyzed: 04/02/19 12:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						
Bromomethane	V4, Z-01, L3	<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)

Prepared: 04/02/19 12:49 Analyzed: 04/02/19 12:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		96	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		101	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10		109	70-130		
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10		101	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		109	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10		105	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10		106	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		108	70-130		
1,2,3-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2,3-Trichloropropane		9.3	0.20	ug/L	10		93	70-130		
1,2,4-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2,4-Trimethylbenzene		9.7	1.0	ug/L	10		97	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.0	1.0	ug/L	10		90	70-130		
1,2-Dibromoethane (EDB)		9.5	0.50	ug/L	10		95	70-130		
1,2-Dichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10		105	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10		106	70-130		
1,3,5-Trimethylbenzene		9.8	1.0	ug/L	10		98	70-130		
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10		100	70-130		
1,4-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		114	70-130		
2-Chlorotoluene		9.7	1.0	ug/L	10		97	70-130		
4-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130		
Acetone		97	20	ug/L	100		97	70-130		
Allyl chloride		10	1.0	ug/L	10		101	70-130		
Benzene		10	0.50	ug/L	10		103	70-130		
Bromobenzene		9.5	1.0	ug/L	10		95	70-130		
Bromochloromethane		11	1.0	ug/L	10		106	70-130		
Bromodichloromethane		11	1.0	ug/L	10		107	70-130		
Bromoform		10	1.0	ug/L	10		100	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane	L3, V4, Z-01	5.8	2.0	ug/L	10		58	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		114	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		9.7	0.50	ug/L	10		97	70-130		
Chloroethane		11	1.0	ug/L	10		106	70-130		
Chloroform		11	1.0	ug/L	10		107	70-130		
Chloromethane		8.4	1.0	ug/L	10		84	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130		
Dibromomethane		10	1.0	ug/L	10		104	70-130		
Dichlorodifluoromethane		8.3	1.0	ug/L	10		83	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		110	70-130		
Ethyl ether		10	1.0	ug/L	10		101	70-130		
Ethylbenzene		10	1.0	ug/L	10		100	70-130		
Hexachlorobutadiene		9.9	0.50	ug/L	10		99	70-130		
Isopropylbenzene		10	1.0	ug/L	10		100	70-130		
Methyl ethyl ketone (MEK)		49	10	ug/L	50		99	70-130		
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		104	70-130		
Methylene chloride		10	1.0	ug/L	10		105	70-130		
Naphthalene		9.2	1.0	ug/L	10		92	70-130		
n-Butylbenzene		10	1.0	ug/L	10		104	70-130		
n-Propylbenzene		10	1.0	ug/L	10		100	70-130		
o-Xylene		9.6	1.0	ug/L	10		96	70-130		
p&m-Xylene		10	1.0	ug/L	10		101	70-130		
p-Isopropyltoluene		9.9	1.0	ug/L	10		99	70-130		
sec-Butylbenzene		10	1.0	ug/L	10		100	70-130		
Styrene		9.3	1.0	ug/L	10		93	70-130		
tert-Butylbenzene		9.7	1.0	ug/L	10		97	70-130		
Tetrachloroethene		10	1.0	ug/L	10		103	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100		101	70-130		
Toluene		9.9	1.0	ug/L	10		99	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130		
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		11	1.0	ug/L	10		109	70-130		
Vinyl chloride		9.8	0.050	ug/L	10		98	70-130		

LCS Dup (B9D0019-BS1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		97	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		100	70-130	0.6	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	3	30
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10		95	70-130	1	30
1,1,2-Trichloroethane		10	0.50	ug/L	10		103	70-130	2	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		108	70-130	1	30
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130	1	30
1,1-Dichloroethene		10	1.0	ug/L	10		102	70-130	4	30
1,1-Dichloropropene		11	1.0	ug/L	10		107	70-130	1	30
1,2,3-Trichlorobenzene		9.7	1.0	ug/L	10		97	70-130	0.5	30
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130	2	30
1,2,4-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130	0.6	30
1,2,4-Trimethylbenzene		9.4	1.0	ug/L	10		94	70-130	2	30
1,2-Dibromo-3-chloropropane (DBCP)		9.3	1.0	ug/L	10		93	70-130	3	30
1,2-Dibromoethane (EDB)		9.6	0.50	ug/L	10		96	70-130	0.5	30
1,2-Dichlorobenzene		9.5	1.0	ug/L	10		95	70-130	0.5	30
1,2-Dichloroethane		11	0.20	ug/L	10		106	70-130	0.7	30
1,2-Dichloropropane		10	1.0	ug/L	10		105	70-130	1	30
1,3,5-Trimethylbenzene		9.5	1.0	ug/L	10		95	70-130	2	30
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	0.7	30
1,3-Dichloropropane		10	1.0	ug/L	10		101	70-130	2	30
1,4-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	3	30
2,2-Dichloropropane		11	1.0	ug/L	10		108	70-130	5	30
2-Chlorotoluene		9.7	1.0	ug/L	10		97	70-130	0.1	30
4-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130	0.8	30
Acetone		94	20	ug/L	100		94	70-130	3	30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS Dup (B9D0019-BSD1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		9.9	1.0	ug/L	10		99	70-130	3	30
Benzene		10	0.50	ug/L	10		102	70-130	2	30
Bromobenzene		9.6	1.0	ug/L	10		96	70-130	0.3	30
Bromochloromethane		10	1.0	ug/L	10		104	70-130	1	30
Bromodichloromethane		10	1.0	ug/L	10		104	70-130	3	30
Bromoform		9.8	1.0	ug/L	10		98	70-130	2	30
Bromomethane	L3, V4, Z-01	6.4	2.0	ug/L	10		64	70-130	10	30
Carbon tetrachloride		11	0.20	ug/L	10		112	70-130	2	30
Chlorobenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Chlorodibromomethane		9.8	0.50	ug/L	10		98	70-130	1	30
Chloroethane		10	1.0	ug/L	10		102	70-130	4	30
Chloroform		10	1.0	ug/L	10		104	70-130	3	30
Chloromethane		8.3	1.0	ug/L	10		83	70-130	0.7	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130	1	30
cis-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130	2	30
Dibromomethane		11	1.0	ug/L	10		106	70-130	2	30
Dichlorodifluoromethane		8.0	1.0	ug/L	10		80	70-130	3	30
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130	2	30
Ethyl ether		9.9	1.0	ug/L	10		99	70-130	2	30
Ethylbenzene		10	1.0	ug/L	10		100	70-130	0.2	30
Hexachlorobutadiene		9.9	0.50	ug/L	10		99	70-130	0.1	30
Isopropylbenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Methyl ethyl ketone (MEK)		48	10	ug/L	50		96	70-130	3	30
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130	0.1	30
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10		106	70-130	2	30
Methylene chloride		10	1.0	ug/L	10		104	70-130	1	30
Naphthalene		9.4	1.0	ug/L	10		94	70-130	2	30
n-Butylbenzene		10	1.0	ug/L	10		103	70-130	1	30
n-Propylbenzene		10	1.0	ug/L	10		100	70-130	0.1	30
o-Xylene		9.6	1.0	ug/L	10		96	70-130	0.1	30
p&m-Xylene		10	1.0	ug/L	10		101	70-130	0.3	30
p-Isopropyltoluene		9.8	1.0	ug/L	10		98	70-130	1	30
sec-Butylbenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Styrene		9.5	1.0	ug/L	10		95	70-130	1	30
tert-Butylbenzene		9.6	1.0	ug/L	10		96	70-130	1	30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS Dup (B9D0019-BSD1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		9.9	1.0	ug/L	10		99	70-130	4	30
Tetrahydrofuran (THF)		99	10	ug/L	100		99	70-130	2	30
Toluene		9.8	1.0	ug/L	10		98	70-130	2	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130	2	30
trans-1,3-Dichloropropene		10	0.50	ug/L	10		103	70-130	5	30
Trichloroethene (TCE)		9.8	0.10	ug/L	10		98	70-130	3	30
Trichlorofluoromethane		10	1.0	ug/L	10		105	70-130	4	30
Vinyl chloride		9.4	0.050	ug/L	10		94	70-130	3	30

Duplicate (B9D0019-DUP1)

Source: 19C1274-05

Prepared: 04/02/19 14:13 Analyzed: 04/02/19 14:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Duplicate (B9D0019-DUP1)

Source: 19C1274-05

Prepared: 04/02/19 14:13 Analyzed: 04/02/19 14:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		<	1.0	ug/L		<				30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		<	0.50	ug/L		<				30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane	L3, V4, Z-01	<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		<	1.0	ug/L		<				30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		<	1.0	ug/L		<				30
cis-1,2-Dichloroethene		<	1.0	ug/L		<				30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		<	1.0	ug/L		<				30
Ethyl ether		3.1	1.0	ug/L		3.1			0	30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Duplicate (B9D0019-DUP1)

Source: 19C1274-05

Prepared: 04/02/19 14:13 Analyzed: 04/02/19 14:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		2.8	10	ug/L		<			1	30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		<	0.10	ug/L		<				30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		<	0.050	ug/L		<				30

Matrix Spike (B9D0019-MS1)

Source: 19C1274-04

Prepared: 04/02/19 11:26 Analyzed: 04/02/19 11:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		94	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		11	1.0	ug/L	10	<	105	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	115	70-130		
1,1,2,2-Tetrachloroethane		9.8	0.50	ug/L	10	<	98	70-130		
1,1,2-Trichloroethane		11	0.50	ug/L	10	<	106	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10	<	118	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	111	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	114	70-130		
1,1-Dichloropropene		12	1.0	ug/L	10	<	117	70-130		
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2,3-Trichloropropane		9.7	0.20	ug/L	10	<	97	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	101	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10	<	101	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.0	1.0	ug/L	10	<	90	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

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Batch B9D0019 - EPA 5030B Preparation

Matrix Spike (B9D0019-MS1)		Source: 19C1274-04		Prepared: 04/02/19 11:26		Analyzed: 04/02/19 11:26		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	104	70-130		
1,2-Dichlorobenzene		9.9	1.0	ug/L	10	<	99	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10	<	112	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10	<	113	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichloropropane		11	1.0	ug/L	10	<	105	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10	<	104	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	123	70-130		
2-Chlorotoluene		10	1.0	ug/L	10	<	101	70-130		
4-Chlorotoluene		10	1.0	ug/L	10	<	101	70-130		
Acetone		95	20	ug/L	100	<	95	70-130		
Allyl chloride		11	1.0	ug/L	10	<	110	70-130		
Benzene		11	0.50	ug/L	10	<	110	70-130		
Bromobenzene		9.8	1.0	ug/L	10	<	98	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	110	70-130		
Bromodichloromethane		11	1.0	ug/L	10	<	111	70-130		
Bromoform		10	1.0	ug/L	10	<	101	70-130		
Bromomethane	L3, V4, Z-01	7.3	2.0	ug/L	10	<	73	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	122	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	107	70-130		
Chlorodibromomethane		10	0.50	ug/L	10	<	101	70-130		
Chloroethane		11	1.0	ug/L	10	<	112	70-130		
Chloroform		11	1.0	ug/L	10	<	114	70-130		
Chloromethane		9.3	1.0	ug/L	10	<	93	70-130		
cis-1,2-Dichloroethene		11	1.0	ug/L	10	<	109	70-130		
cis-1,3-Dichloropropene		11	0.50	ug/L	10	<	106	70-130		
Dibromomethane		11	1.0	ug/L	10	<	112	70-130		
Dichlorodifluoromethane		9.0	1.0	ug/L	10	<	90	70-130		
Dichlorofluoromethane		12	1.0	ug/L	10	<	118	70-130		
Ethyl ether		13	1.0	ug/L	10	3.3	102	70-130		
Ethylbenzene		11	1.0	ug/L	10	<	105	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10	<	104	70-130		
Isopropylbenzene		11	1.0	ug/L	10	<	108	70-130		
Methyl ethyl ketone (MEK)		49	10	ug/L	50	<	99	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Matrix Spike (B9D0019-MS1)

Source: 19C1274-04

Prepared: 04/02/19 11:26 Analyzed: 04/02/19 11:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50	<	103	70-130		
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10	<	110	70-130		
Methylene chloride		11	1.0	ug/L	10	<	113	70-130		
Naphthalene		9.6	1.0	ug/L	10	<	96	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	111	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	106	70-130		
o-Xylene		10	1.0	ug/L	10	<	103	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	105	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10	<	104	70-130		
sec-Butylbenzene		11	1.0	ug/L	10	<	106	70-130		
Styrene		9.9	1.0	ug/L	10	<	99	70-130		
tert-Butylbenzene		10	1.0	ug/L	10	<	102	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	106	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100	<	98	70-130		
Toluene		10	1.0	ug/L	10	<	104	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	111	70-130		
trans-1,3-Dichloropropene		11	0.50	ug/L	10	<	107	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	108	70-130		
Trichlorofluoromethane		12	1.0	ug/L	10	<	116	70-130		
Vinyl chloride		11	0.050	ug/L	10	<	106	70-130		

FINAL REPORT

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0172 - 1,4 Dioxane in Water SPE

Blank (B9D0172-BLK1) Prepared: 04/11/19 09:00 Analyzed: 04/15/19 10:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L						

Blank (B9D0172-BLK2) Prepared: 04/11/19 09:00 Analyzed: 04/16/19 10:23

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L						

LCS (B9D0172-BS1) Prepared: 04/11/19 09:00 Analyzed: 04/15/19 10:17

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.21	0.050	ug/L	0.19		105	80-120		

Duplicate (B9D0172-DUP1) Source: 19C1040-07 Prepared: 04/11/19 09:00 Analyzed: 04/15/19 10:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.59	0.050	ug/L		0.61			4	30

Matrix Spike (B9D0172-MS1) Source: 19C1040-08 Prepared: 04/11/19 09:00 Analyzed: 04/15/19 11:21

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.75	0.051	ug/L	0.45	0.25	109	70-130		

Batch B9D0228 - 1,4 Dioxane in Water SPE

Blank (B9D0228-BLK1) Prepared: 04/12/19 09:22 Analyzed: 04/23/19 10:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L						

Blank (B9D0228-BLK2) Prepared: 04/12/19 09:22 Analyzed: 04/24/19 17:54

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L						

Blank (B9D0228-BLK3) Prepared: 04/12/19 09:22 Analyzed: 04/25/19 10:34

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0228 - 1,4 Dioxane in Water SPE

Blank (B9D0228-BLK3)

Prepared: 04/12/19 09:22 Analyzed: 04/25/19 10:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L						

LCS (B9D0228-BS1)

Prepared: 04/12/19 09:22 Analyzed: 04/23/19 10:41

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.22	0.052	ug/L	0.20		108	80-120		

Duplicate (B9D0228-DUP1)

Source: 19C1238-03

Prepared: 04/12/19 09:22 Analyzed: 04/23/19 13:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L		<				30

Matrix Spike (B9D0228-MS2)

Source: 19C1238-04RE1

Prepared: 04/12/19 09:22 Analyzed: 04/24/19 19:29

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	D2, M4	28	0.51	ug/L	0.45	29	NR	70-130		

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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0105 - PFCs Preparation

Blank (B9D0105-BLK1)

Prepared: 04/05/19 13:42 Analyzed: 04/05/19 13:42

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0105-BLK2)

Prepared: 04/05/19 18:09 Analyzed: 04/05/19 18:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0105-BS1)

Prepared: 04/05/19 13:34 Analyzed: 04/05/19 13:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50		98	80-120		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5		107	80-120		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50		103	80-120		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5		101	80-120		
Perfluorooctanesulfonate (PFOS)		0.45	0.025	ug/L	0.49		91	80-120		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5		98	80-120		
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5		101	80-120		

LCS Dup (B9D0105-BSD1)

Prepared: 04/05/19 18:01 Analyzed: 04/05/19 18:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50		106	80-120	8	20
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5		105	80-120	1	20
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50		107	80-120	3	20

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Final Report
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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0105 - PFCs Preparation

LCS Dup (B9D0105-BSD1)

Prepared: 04/05/19 18:01 Analyzed: 04/05/19 18:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		107	80-120	6	20
Perfluorooctanesulfonate (PFOS)		0.49	0.025	ug/L	0.49		97	80-120	6	20
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5		107	80-120	9	20
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		103	80-120	3	20

Duplicate (B9D0105-DUP1)

Source: 19C1132-03

Prepared: 04/05/19 14:39 Analyzed: 04/05/19 14:39

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L		<				20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L		<				20
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L		<				20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B9D0105-MS1)

Source: 19C1132-03

Prepared: 04/05/19 14:31 Analyzed: 04/05/19 14:31

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	103	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	97	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0105-MS2)

Source: 19C1132-01

Prepared: 04/05/19 13:58 Analyzed: 04/05/19 13:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	97	70-130		
Perfluorobutanoic acid (PFBA)		0.68	0.050	ug/L	0.5	0.17	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.47	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	102	70-130		

FINAL REPORT

Report ID: 04262019 91928

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0105 - PFCs Preparation

Matrix Spike (B9D0105-MS2) Source: 19C1132-01 Prepared: 04/05/19 13:58 Analyzed: 04/05/19 13:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	106	70-130		

Matrix Spike (B9D0105-MS3) Source: 19C1132-02 Prepared: 04/05/19 14:15 Analyzed: 04/05/19 14:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	109	70-130		
Perfluorobutanoic acid (PFBA)		0.71	0.050	ug/L	0.5	0.16	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	98	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0105-MS4) Source: 19C1132-04 Prepared: 04/05/19 15:03 Analyzed: 04/05/19 15:03

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.56	0.050	ug/L	0.50	<	112	70-130		
Perfluorobutanoic acid (PFBA)		0.69	0.050	ug/L	0.5	0.17	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.55	0.050	ug/L	0.5	<	109	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	0.025	97	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0105-MS5) Source: 19C1132-05 Prepared: 04/05/19 15:19 Analyzed: 04/05/19 15:19

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50	<	109	70-130		
Perfluorobutanoic acid (PFBA)		0.72	0.050	ug/L	0.5	0.19	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	108	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0105 - PFCs Preparation

Matrix Spike (B9D0105-MS6) Source: 19C1132-06 Prepared: 04/05/19 15:36 Analyzed: 04/05/19 15:36

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.74	0.050	ug/L	0.5	0.21	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	99	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	0.036	99	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0105-MS7) Source: 19C1132-07 Prepared: 04/05/19 15:52 Analyzed: 04/05/19 15:52

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	108	70-130		
Perfluorobutanoic acid (PFBA)		0.76	0.050	ug/L	0.5	0.23	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	98	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	97	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0105-MS8) Source: 19C1132-08 Prepared: 04/05/19 16:08 Analyzed: 04/05/19 16:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.57	0.050	ug/L	0.5	0.052	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	102	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0105-MS9) Source: 19C1132-09 Prepared: 04/05/19 16:24 Analyzed: 04/05/19 16:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.74	0.050	ug/L	0.5	0.22	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0105 - PFCs Preparation

Matrix Spike (B9D0105-MS9) Source: 19C1132-09 Prepared: 04/05/19 16:24 Analyzed: 04/05/19 16:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	100	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0105-MSA) Source: 19C1132-10 Prepared: 04/05/19 16:40 Analyzed: 04/05/19 16:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	108	70-130		
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5	<	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	104	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0105-MSB) Source: 19C1132-11 Prepared: 04/05/19 16:56 Analyzed: 04/05/19 16:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.64	0.050	ug/L	0.5	0.13	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	101	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0105-MSC) Source: 19C1132-12 Prepared: 04/05/19 17:12 Analyzed: 04/05/19 17:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.73	0.050	ug/L	0.5	0.21	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5	<	98	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	101	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	101	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0105 - PFCs Preparation

Matrix Spike (B9D0105-MSC) Source: 19C1132-12 Prepared: 04/05/19 17:12 Analyzed: 04/05/19 17:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0105-MSD) Source: 19C1235-02 Prepared: 04/05/19 17:29 Analyzed: 04/05/19 17:29

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5	<	102	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike Dup (B9D0105-MSD1) Source: 19C1132-03 Prepared: 04/05/19 14:47 Analyzed: 04/05/19 14:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130	2	20
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	104	70-130	2	20
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	103	70-130	0.05	20
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	99	70-130	4	20
Perfluorooctanesulfonate (PFOS)		0.46	0.025	ug/L	0.49	<	91	70-130	6	20
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130	0.4	20
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	108	70-130	4	20

Matrix Spike (B9D0105-MSE) Source: 19C1235-03 Prepared: 04/05/19 17:45 Analyzed: 04/05/19 17:45

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	104	70-130		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5	<	98	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	102	70-130		
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5	<	105	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	108	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0111 - PFCs Preparation

Blank (B9D0111-BLK1)

Prepared: 04/05/19 18:09 Analyzed: 04/05/19 18:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0111-BLK2)

Prepared: 04/05/19 23:08 Analyzed: 04/05/19 23:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0111-BS1)

Prepared: 04/05/19 18:01 Analyzed: 04/05/19 18:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50		106	80-120		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5		105	80-120		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50		107	80-120		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		107	80-120		
Perfluorooctanesulfonate (PFOS)		0.49	0.025	ug/L	0.49		97	80-120		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5		107	80-120		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		103	80-120		

LCS Dup (B9D0111-BSD1)

Prepared: 04/05/19 23:00 Analyzed: 04/05/19 23:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		101	80-120	6	20
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5		105	80-120	0.5	20
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50		101	80-120	6	20

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0111 - PFCs Preparation

LCS Dup (B9D0111-BSD1)

Prepared: 04/05/19 23:00 Analyzed: 04/05/19 23:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5		102	80-120	4	20
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49		100	80-120	3	20
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5		104	80-120	2	20
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5		106	80-120	3	20

Duplicate (B9D0111-DUP1)

Source: 19C1235-04

Prepared: 04/05/19 18:33 Analyzed: 04/05/19 18:33

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)	J	0.018	0.050	ug/L		<			15	20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)	J	0.011	0.025	ug/L		<			19	20
Perfluorooctanoic acid (PFOA)	J	0.019	0.035	ug/L		<			13	20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B9D0111-MS1)

Source: 19C1235-04

Prepared: 04/05/19 18:25 Analyzed: 04/05/19 18:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	105	70-130		
Perfluorooctanesulfonate (PFOS)		0.49	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	96	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0111-MS2)

Source: 19C1235-05

Prepared: 04/05/19 18:58 Analyzed: 04/05/19 18:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	96	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	101	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0111 - PFCs Preparation

Matrix Spike (B9D0111-MS2) Source: 19C1235-05 Prepared: 04/05/19 18:58 Analyzed: 04/05/19 18:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0111-MS3) Source: 19C1235-06 Prepared: 04/05/19 19:14 Analyzed: 04/05/19 19:14

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.56	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.63	0.050	ug/L	0.5	0.11	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.68	0.025	ug/L	0.49	0.20	98	70-130		
Perfluorooctanoic acid (PFOA)		1.5	0.035	ug/L	0.5	1.0	95	70-130		
Perfluoropentanoic acid (PFPeA)		0.57	0.050	ug/L	0.5	0.062	101	70-130		

Matrix Spike (B9D0111-MS4) Source: 19C1235-07 Prepared: 04/05/19 19:30 Analyzed: 04/05/19 19:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.57	0.050	ug/L	0.5	<	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5	<	98	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	0.045	90	70-130		
Perfluorooctanoic acid (PFOA)		0.70	0.035	ug/L	0.5	0.19	102	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	107	70-130		

Matrix Spike (B9D0111-MS5) Source: 19C1235-08 Prepared: 04/05/19 19:46 Analyzed: 04/05/19 19:46

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.63	0.050	ug/L	0.5	0.10	106	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.59	0.050	ug/L	0.5	0.084	101	70-130		
Perfluorooctanesulfonate (PFOS)		0.60	0.025	ug/L	0.49	0.082	103	70-130		
Perfluorooctanoic acid (PFOA)		0.91	0.035	ug/L	0.5	0.39	104	70-130		
Perfluoropentanoic acid (PFPeA)		0.56	0.050	ug/L	0.5	<	106	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0111 - PFCs Preparation

Matrix Spike (B9D0111-MS6) Source: 19C1235-09 Prepared: 04/05/19 20:03 Analyzed: 04/05/19 20:03

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.62	0.050	ug/L	0.5	0.11	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	103	70-130		
Perfluorohexanoic acid (PFHxA)		0.57	0.050	ug/L	0.5	0.061	101	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	0.083	89	70-130		
Perfluorooctanoic acid (PFOA)		0.86	0.035	ug/L	0.5	0.36	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0111-MS7) Source: 19C1235-10 Prepared: 04/05/19 20:19 Analyzed: 04/05/19 20:19

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.56	0.050	ug/L	0.5	<	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	0.031	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.57	0.050	ug/L	0.5	0.057	102	70-130		
Perfluorooctanesulfonate (PFOS)		0.63	0.025	ug/L	0.49	0.17	93	70-130		
Perfluorooctanoic acid (PFOA)		3.0	0.035	ug/L	0.5	2.6	82	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0111-MS8) Source: 19C1235-11 Prepared: 04/05/19 20:35 Analyzed: 04/05/19 20:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.58	0.050	ug/L	0.5	0.067	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50	0.030	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.58	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.63	0.025	ug/L	0.49	0.13	100	70-130		
Perfluorooctanoic acid (PFOA)		1.0	0.035	ug/L	0.5	0.57	96	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0111-MS9) Source: 19C1235-12 Prepared: 04/05/19 20:51 Analyzed: 04/05/19 20:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.56	0.050	ug/L	0.50	<	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.79	0.025	ug/L	0.50	0.29	99	70-130		
Perfluorohexanoic acid (PFHxA)		1.4	0.050	ug/L	0.5	0.89	103	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0111 - PFCs Preparation

Matrix Spike (B9D0111-MS9) Source: 19C1235-12 Prepared: 04/05/19 20:51 Analyzed: 04/05/19 20:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanesulfonate (PFOS)		0.56	0.025	ug/L	0.49	0.092	94	70-130		
Perfluorooctanoic acid (PFOA)		0.87	0.035	ug/L	0.5	0.41	92	70-130		
Perfluoropentanoic acid (PFPeA)		1.5	0.050	ug/L	0.5	1.0	99	70-130		

Matrix Spike (B9D0111-MSA) Source: 19C1238-01 Prepared: 04/05/19 21:07 Analyzed: 04/05/19 21:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.58	0.050	ug/L	0.5	0.063	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	99	70-130		
Perfluorooctanoic acid (PFOA)		0.73	0.035	ug/L	0.5	0.23	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.59	0.050	ug/L	0.5	0.058	106	70-130		

Matrix Spike (B9D0111-MSB) Source: 19C1238-02 Prepared: 04/05/19 21:23 Analyzed: 04/05/19 21:23

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.86	0.050	ug/L	0.5	0.33	106	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	105	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	98	70-130		
Perfluorooctanoic acid (PFOA)		0.57	0.035	ug/L	0.5	0.057	102	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0111-MSC) Source: 19C1238-03 Prepared: 04/05/19 21:39 Analyzed: 04/05/19 21:39

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		1.0	0.050	ug/L	0.5	0.53	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	99	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	0.046	97	70-130		
Perfluorooctanoic acid (PFOA)		0.59	0.035	ug/L	0.5	0.11	97	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	105	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0111 - PFCs Preparation

Matrix Spike (B9D0111-MSD)		Source: 19C1238-04		Prepared: 04/05/19 21:56 Analyzed: 04/05/19 21:56						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.68	0.050	ug/L	0.50	0.16	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.73	0.025	ug/L	0.50	0.27	92	70-130		
Perfluorohexanoic acid (PFHxA)		3.2	0.050	ug/L	0.5	2.8	74	70-130		
Perfluorooctanesulfonate (PFOS)		1.1	0.025	ug/L	0.49	0.56	99	70-130		
Perfluoropentanoic acid (PFPeA)		2.4	0.050	ug/L	0.5	1.9	98	70-130		

Matrix Spike Dup (B9D0111-MSD1)		Source: 19C1235-04		Prepared: 04/05/19 18:41 Analyzed: 04/05/19 18:41						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	108	70-130	7	20
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5	<	102	70-130	1	20
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130	0.1	20
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130	0.3	20
Perfluorooctanesulfonate (PFOS)		0.49	0.025	ug/L	0.49	<	96	70-130	0.08	20
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	96	70-130	0.4	20
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	103	70-130	0.8	20

Matrix Spike (B9D0111-MSE)		Source: 19C1238-05		Prepared: 04/05/19 22:12 Analyzed: 04/05/19 22:12						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.78	0.050	ug/L	0.50	0.25	106	70-130		
Perfluorohexanesulfonate (PFHxS)		0.83	0.025	ug/L	0.50	0.32	104	70-130		
Perfluorohexanoic acid (PFHxA)		3.9	0.050	ug/L	0.5	3.3	120	70-130		
Perfluorooctanesulfonate (PFOS)		1.4	0.025	ug/L	0.49	0.97	87	70-130		
Perfluoropentanoic acid (PFPeA)		2.9	0.050	ug/L	0.5	2.5	99	70-130		

Matrix Spike (B9D0111-MSF)		Source: 19C1238-06		Prepared: 04/05/19 22:28 Analyzed: 04/05/19 22:28						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.77	0.050	ug/L	0.50	0.25	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.76	0.025	ug/L	0.50	0.27	98	70-130		
Perfluorohexanoic acid (PFHxA)		5.6	0.050	ug/L	0.5	5.2	77	70-130		
Perfluorooctanesulfonate (PFOS)		1.1	0.025	ug/L	0.49	0.64	93	70-130		
Perfluoropentanoic acid (PFPeA)		4.3	0.050	ug/L	0.5	3.9	80	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0111 - PFCs Preparation

Matrix Spike (B9D0111-MSG) Source: 19C1238-07 Prepared: 04/05/19 22:44 Analyzed: 04/05/19 22:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.57	0.050	ug/L	0.50	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.59	0.025	ug/L	0.50	0.085	100	70-130		
Perfluorohexanoic acid (PFHxA)		1.3	0.050	ug/L	0.5	0.85	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.59	0.025	ug/L	0.49	0.091	99	70-130		
Perfluoropentanoic acid (PFPeA)		1.1	0.050	ug/L	0.5	0.59	105	70-130		

Batch B9D0150 - PFCs Preparation

Blank (B9D0150-BLK1) Prepared: 04/08/19 20:22 Analyzed: 04/08/19 20:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0150-BLK2) Prepared: 04/09/19 02:25 Analyzed: 04/09/19 02:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0150-BS1) Prepared: 04/08/19 20:14 Analyzed: 04/08/19 20:14

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		101	80-120		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5		103	80-120		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50		105	80-120		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0150 - PFCs Preparation

LCS (B9D0150-BS1)

Prepared: 04/08/19 20:14 Analyzed: 04/08/19 20:14

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5		108	80-120		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49		102	80-120		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5		104	80-120		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5		103	80-120		

LCS Dup (B9D0150-BSD1)

Prepared: 04/09/19 02:17 Analyzed: 04/09/19 02:17

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50		102	80-120	1	20
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5		105	80-120	1	20
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50		106	80-120	0.2	20
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5		108	80-120	0.3	20
Perfluorooctanesulfonate (PFOS)		0.54	0.025	ug/L	0.49		109	80-120	6	20
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5		102	80-120	1	20
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5		108	80-120	5	20

Duplicate (B9D0150-DUP1)

Source: 19C1235-12RE1

Prepared: 04/08/19 20:46 Analyzed: 04/08/19 20:46

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)	D1	<	0.25	ug/L		<				20
Perfluorobutanoic acid (PFBA)	D1	7.4	0.25	ug/L		7.4			1	20
Perfluorohexanesulfonate (PFHxS)	D1	0.26	0.12	ug/L		0.31			15	20
Perfluorohexanoic acid (PFHxA)	D1	0.99	0.25	ug/L		0.85			15	20
Perfluorooctanesulfonate (PFOS)	D1	<	0.12	ug/L		<				20
Perfluorooctanoic acid (PFOA)	D1	0.44	0.18	ug/L		0.41			6	20
Perfluoropentanoic acid (PFPeA)	D1	1.2	0.25	ug/L		1.1			6	20

Matrix Spike (B9D0150-MS1)

Source: 19C1235-12RE1

Prepared: 04/08/19 20:38 Analyzed: 04/08/19 20:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)	D1	2.4	0.25	ug/L	2.50	<	95	70-130		
Perfluorobutanoic acid (PFBA)	D1	9.9	0.25	ug/L	2.5	7.4	100	70-130		
Perfluorohexanesulfonate (PFHxS)	D1	2.8	0.12	ug/L	2.50	0.31	101	70-130		
Perfluorohexanoic acid (PFHxA)	D1	3.5	0.25	ug/L	2.5	0.85	104	70-130		
Perfluorooctanesulfonate (PFOS)	D1	2.8	0.12	ug/L	2.49	<	107	70-130		
Perfluorooctanoic acid (PFOA)	D1	3.0	0.18	ug/L	2.5	0.41	102	70-130		

FINAL REPORT

Report ID: 04262019 91928

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0150 - PFCs Preparation

Matrix Spike (B9D0150-MS1) Source: 19C1235-12RE1 Prepared: 04/08/19 20:38 Analyzed: 04/08/19 20:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)	D1	3.7	0.25	ug/L	2.5	1.1	104	70-130		

Matrix Spike (B9D0150-MS2) Source: 19C1238-01RE1 Prepared: 04/08/19 21:10 Analyzed: 04/08/19 21:10

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1	7.6	0.25	ug/L	2.5	5.1	100	70-130		

Matrix Spike (B9D0150-MS3) Source: 19C1238-04RE1 Prepared: 04/08/19 21:27 Analyzed: 04/08/19 21:27

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	D1	15	0.18	ug/L	2.5	13	74	70-130		

Matrix Spike (B9D0150-MS5) Source: 19C1238-04RE3 Prepared: 04/08/19 21:59 Analyzed: 04/08/19 21:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1	220	5.0	ug/L	50	170	95	70-130		

Matrix Spike (B9D0150-MS6) Source: 19C1238-05RE1 Prepared: 04/08/19 22:15 Analyzed: 04/08/19 22:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	D1	19	0.18	ug/L	2.5	17	80	70-130		

Matrix Spike (B9D0150-MS8) Source: 19C1238-05RE3 Prepared: 04/08/19 22:48 Analyzed: 04/08/19 22:48

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1	280	5.0	ug/L	50	250	73	70-130		

Matrix Spike (B9D0150-MSA) Source: 19C1238-06RE2 Prepared: 04/08/19 23:20 Analyzed: 04/08/19 23:20

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	D1	30	0.70	ug/L	10	19	103	70-130		

Matrix Spike (B9D0150-MSB) Source: 19C1238-06RE3 Prepared: 04/08/19 23:36 Analyzed: 04/08/19 23:36

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1	490	5.0	ug/L	50	450	83	70-130		

FINAL REPORT

Report ID: 04262019 91928

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0150 - PFCs Preparation

Matrix Spike (B9D0150-MSC) Source: 19C1238-07RE1 Prepared: 04/08/19 23:52 Analyzed: 04/08/19 23:52

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	D1	5.8	0.18	ug/L	2.5	3.4	96	70-130		

Matrix Spike (B9D0150-MSD) Source: 19C1238-07RE2 Prepared: 04/09/19 00:08 Analyzed: 04/09/19 00:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1, H2	57	1.0	ug/L	10	45	122	70-130		

Matrix Spike Dup (B9D0150-MSD1) Source: 19C1235-12RE1 Prepared: 04/08/19 20:54 Analyzed: 04/08/19 20:54

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)	D1	2.6	0.25	ug/L	2.50	<	102	70-130	7	20
Perfluorobutanoic acid (PFBA)	D1	10	0.25	ug/L	2.5	7.4	107	70-130	2	20
Perfluorohexanesulfonate (PFHxS)	D1	2.9	0.12	ug/L	2.50	0.31	104	70-130	2	20
Perfluorohexanoic acid (PFHxA)	D1	3.5	0.25	ug/L	2.5	0.85	106	70-130	1	20
Perfluorooctanesulfonate (PFOS)	D1	2.6	0.12	ug/L	2.49	<	102	70-130	5	20
Perfluorooctanoic acid (PFOA)	D1	3.0	0.18	ug/L	2.5	0.41	104	70-130	2	20
Perfluoropentanoic acid (PFPeA)	D1	3.7	0.25	ug/L	2.5	1.1	104	70-130	0.3	20

Matrix Spike (B9D0150-MSF) Source: 19C1238-14RE2 Prepared: 04/09/19 00:40 Analyzed: 04/09/19 00:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1	160	1.0	ug/L	10	160	83	70-130		

Matrix Spike (B9D0150-MSH) Source: 19C1238-15RE2 Prepared: 04/09/19 01:12 Analyzed: 04/09/19 01:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1	87	1.0	ug/L	10	80	70	70-130		
Perfluorooctanoic acid (PFOA)	D1	16	0.70	ug/L	10	6.2	102	70-130		

Matrix Spike (B9D0150-MSI) Source: 19C1238-16RE1 Prepared: 04/09/19 01:29 Analyzed: 04/09/19 01:29

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1	25	0.25	ug/L	2.5	23	72	70-130		

Matrix Spike (B9D0150-MSK) Source: 19C1238-21RE1 Prepared: 04/09/19 02:01 Analyzed: 04/09/19 02:01

FINAL REPORT

Report ID: 04262019 91928

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0150 - PFCs Preparation

Matrix Spike (B9D0150-MSK)

Source: 19C1238-21RE1

Prepared: 04/09/19 02:01 Analyzed: 04/09/19 02:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	D1	17	0.25	ug/L	2.5	14	107	70-130		

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

Z-01a	Low bias demonstrated by continuing calibration verification standard, samples may also display a low bias. Matrix spike recovery was low; the associated LCS/LCSD recovery was also low.
Z-01	Low bias demonstrated by continuing calibration verification standard, samples may also display a low bias.
V4	Calibration verification standard recovery was below method acceptance limits. See comments or additional qualifiers.
M4	The analysis of the spiked sample required a dilution such that the spike recovery calculation does not provide useful information. The associated laboratory control sample and/or laboratory control sample duplicate recovery was acceptable.
L3	The spike recovery was below laboratory acceptance limits for the associated laboratory control sample and/or laboratory control sample duplicate.
J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
F5	The sample pH was greater than 2. The sample was analyzed within the 7 day holding time.
D2	Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
D1	Sample required dilution due to matrix. Reporting limit has been raised.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 4/26/19

Client Name: QW - MPCA - Closed Landfill Assessment

Project Code: QW

Project Name: Closed Landfill Assessment

Work Order Number: 19C1274

Report To: QW - MPCA - Closed Landfill Assessment

Mark Umholtz

520 Lafayette Rd.

Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Moyer", is written over a light gray rectangular background.

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300


<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Work Order Comment: The program code is QW per B. Scruton. -CNN 4/1/19 Use facility code SW-57 per M. Umholtz. -CNN 4/11/19

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
Trip Blank 2	19C1274-01	QC-BLANK	03/28/19 7:30	03/29/19 11:47	1.1
462520	19C1274-02	Wtr-Ground	03/28/19 11:25	03/29/19 11:47	1.1
240818	19C1274-03	Wtr-Ground	03/28/19 11:00	03/29/19 11:47	1.1
462523	19C1274-04	Wtr-Ground	03/28/19 12:30	03/29/19 11:47	1.1
434011	19C1274-05	Wtr-Ground	03/28/19 14:20	03/29/19 11:47	1.1

Authorized by:  Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health	<p><i>The results in this report apply only to the samples analyzed. This report must not be reproduced, except in full, without the written approval of the laboratory.</i></p>
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Chain-of-Custody Form revision 2013.0909

Work Order Number:

COC Type: Standard

Turnaround Time: Standard

COC ID:

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MN SW-057 Program Code (MDH Lab Only):
 Project Name: 19-01567 MPCA Freeway Landfill 2019 MDH Project Task Code: PRJ07786
 Project Manager: Mark Umholtz 651-757-2308
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name: Minnesota Department of Health
 Address: 601 Robert Street N.
 St. Paul MN 55155
 Phone No: 651-201-5058



SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample-Routine Sample
 S-IVP-Integrated Vertical Profile Sample
 S-CWOP-Composite Sample

QC-FB-Field Blank Sample
 QC-FR-Field Replicate Sample
 QC-TB-Trip Blank Sample

LAB MATRIX CODES
 DW-Drinking Water
 NW-Non-potable Water
 SD-Soil/Solid
 WP-Wipe

AR-Air
 BL-Biological Material
 OT-Other
 TS-Tissue

FIELD MATRIX CODES
 Wtr-Ground-Groundwater
 Wtr-Surf-Surface Water
 QC-BLANK-Artificial Blank Water
 Leachate-Leachate Sample

PRESERV. HCl None None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	VOCs EPA 8260D	PFAS by MDH55	1,4 Dioxane	Lab Sample No.	#
Trip Blank 2	QC-TB	3/28/19	0730			G	NW	QC-Blank	N		3		X			01	1
462520	Sample	3/28/19	1125			G	NW	Wtr-Ground	N		5	X	X	X		02	2
240818	Sample	3/28/19	1100			G	NW	Wtr-Ground	N		5	X	X	X		03	3
462523	Sample	3/28/19	1230			G	NW	Wtr-Ground	N		5	X	X	X		04	4
434011	Sample	3/28/19	1420			G	NW	Wtr-Ground	N		5	X	X	X		05	5
									N								6
									N								7
									N								8
									N								9
									N								10

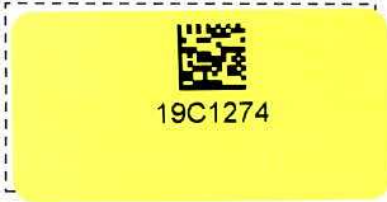
ETA 3/28/19

Sampled By: David Anderson / Chris Pelosi Sampler's Signature: David Anderson Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	3/28/19 / 1630	[Signature] EPA/MDH	3/29/19 / 7:00 AM
[Signature]	3/29/19 / 1145	[Signature]	3/29/19 / 11:47

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory
Data Entry Worksheet
Parcel Information



Date & time of receipt: MAR 29 '19 11:47

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # _____

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can
 None Other _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No Yes

Packaging, Temperature & Radiochemical Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack #() Gel pack #() Dry ice None
 Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 1.1 °C IR thermometer instrument used: A10

Samples received with evidence of freezing: No; Yes _____

Rad Chem. request received: No; Yes, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Initials of person receiving parcel: B

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No Unknown

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Sample submission details are entered in the Environmental Laboratory LIMS.

Initials of person logging in the work order request into LIMS: B

Final Report
Case Narrative

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: SW-57
Collected by: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/2019 16:02

Except where noted in this report, no additional comments are needed for this Work Order.

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-01

Location ID: Trip Blank 2	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-01

Location ID: Trip Blank 2	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
4-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Acetone		<	20	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-01

Location ID: Trip Blank 2	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Methylene chloride		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0001	04/01/19 15:03	04/01/19 15:03	EPA 8260D

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-02

Location ID: 462520	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:25	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Surrogate: 4-Bromofluorobenzene		97	70-130	%	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-02

Location ID: 462520	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:25	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Acetone		<	20	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-02

Location ID: 462520	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:25	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0001	04/01/19 22:54	04/01/19 22:54	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.050	ug/L	1	B9D0396	04/23/19 08:00	04/24/19 13:14	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0148	04/08/19 16:52	04/08/19 16:52	MDH 555
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L	1	B9D0148	04/08/19 16:52	04/08/19 16:52	MDH 555

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-02

Location ID: 462520	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:25	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0148	04/08/19 16:52	04/08/19 16:52	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0148	04/08/19 16:52	04/08/19 16:52	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L	1	B9D0148	04/08/19 16:52	04/08/19 16:52	MDH 555
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L	1	B9D0148	04/08/19 16:52	04/08/19 16:52	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9D0148	04/08/19 16:52	04/08/19 16:52	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-03

Location ID: 240818	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Surrogate: 4-Bromofluorobenzene		97	70-130	%	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-03

Location ID: 240818	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Acetone		72	20	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-03

Location ID: 240818	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0001	04/01/19 23:22	04/01/19 23:22	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.049	ug/L	1	B9D0396	04/23/19 08:00	04/24/19 13:30	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0148	04/08/19 17:08	04/08/19 17:08	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.030	0.050	ug/L	1	B9D0148	04/08/19 17:08	04/08/19 17:08	MDH 555

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-03

Location ID: 240818	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0148	04/08/19 17:08	04/08/19 17:08	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0148	04/08/19 17:08	04/08/19 17:08	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L	1	B9D0148	04/08/19 17:08	04/08/19 17:08	MDH 555
Perfluorooctanoic acid (PFOA)	J	0.009	0.035	ug/L	1	B9D0148	04/08/19 17:08	04/08/19 17:08	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9D0148	04/08/19 17:08	04/08/19 17:08	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-04

Location ID: 462523	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-04

Location ID: 462523	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Ethyl ether		3.3	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-04

Location ID: 462523	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 13:17	04/02/19 13:17	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		6.2	0.049	ug/L	1	B9D0396	04/23/19 08:00	04/24/19 13:45	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0148	04/08/19 17:24	04/08/19 17:24	MDH 555
Perfluorobutanoic acid (PFBA)		0.10	0.050	ug/L	1	B9D0148	04/08/19 17:24	04/08/19 17:24	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-04

Location ID: 462523	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0148	04/08/19 17:24	04/08/19 17:24	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0148	04/08/19 17:24	04/08/19 17:24	MDH 555
Perfluorooctanesulfonate (PFOS)		0.038	0.025	ug/L	1	B9D0148	04/08/19 17:24	04/08/19 17:24	MDH 555
Perfluorooctanoic acid (PFOA)		0.11	0.035	ug/L	1	B9D0148	04/08/19 17:24	04/08/19 17:24	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.014	0.050	ug/L	1	B9D0148	04/08/19 17:24	04/08/19 17:24	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-05

Location ID: 434011	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-05

Location ID: 434011	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Ethyl ether		3.1	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-05

Location ID: 434011	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 13:45	04/02/19 13:45	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		9.9	0.049	ug/L	1	B9D0396	04/23/19 08:00	04/24/19 14:01	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0148	04/08/19 17:40	04/08/19 17:40	MDH 555
Perfluorobutanoic acid (PFBA)		0.16	0.050	ug/L	1	B9D0148	04/08/19 17:40	04/08/19 17:40	MDH 555

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

MDH Sample Number: 19C1274-05

Location ID: 434011	Collect Date: 03/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0148	04/08/19 17:40	04/08/19 17:40	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.024	0.050	ug/L	1	B9D0148	04/08/19 17:40	04/08/19 17:40	MDH 555
Perfluorooctanesulfonate (PFOS)	J	0.016	0.025	ug/L	1	B9D0148	04/08/19 17:40	04/08/19 17:40	MDH 555
Perfluorooctanoic acid (PFOA)		0.083	0.035	ug/L	1	B9D0148	04/08/19 17:40	04/08/19 17:40	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.021	0.050	ug/L	1	B9D0148	04/08/19 17:40	04/08/19 17:40	MDH 555

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Batch Summary

Samples in Batch: B9D0001 - EPA 5030B Preparation

19C1274-01 19C1274-02 19C1274-03

Samples in Batch: B9D0019 - EPA 5030B Preparation

19C1274-04 19C1274-05

Samples in Batch: B9D0148 - PFCs Preparation

19C1274-02 19C1274-03 19C1274-04 19C1274-05

Samples in Batch: B9D0396 - 1,4 Dioxane in Water SPE

19C1274-02 19C1274-03 19C1274-04 19C1274-05

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

Blank (B9D0001-BLK1)

Prepared: 04/01/19 14:35 Analyzed: 04/01/19 14:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

FINAL REPORT

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

Blank (B9D0001-BLK1)

Prepared: 04/01/19 14:35 Analyzed: 04/01/19 14:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane	L3, V4, Z-01	<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

Blank (B9D0001-BLK1)

Prepared: 04/01/19 14:35 Analyzed: 04/01/19 14:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B9D0001-BS1)

Prepared: 04/01/19 12:44 Analyzed: 04/01/19 12:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		95	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		102	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		102	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10		107	70-130		
1,1,2,2-Tetrachloroethane		9.7	0.50	ug/L	10		97	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10		102	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		109	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		104	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		107	70-130		
1,2,3-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,3-Trichloropropane		9.7	0.20	ug/L	10		97	70-130		
1,2,4-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,4-Trimethylbenzene		9.9	1.0	ug/L	10		99	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.8	1.0	ug/L	10		98	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		100	70-130		
1,2-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10		106	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10		104	70-130		
1,3,5-Trimethylbenzene		9.7	1.0	ug/L	10		97	70-130		
1,3-Dichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
1,3-Dichloropropane		9.8	1.0	ug/L	10		98	70-130		
1,4-Dichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		115	70-130		
2-Chlorotoluene		9.8	1.0	ug/L	10		98	70-130		
4-Chlorotoluene		9.8	1.0	ug/L	10		98	70-130		
Acetone		100	20	ug/L	100		101	70-130		

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

LCS (B9D0001-BS1)

Prepared: 04/01/19 12:44 Analyzed: 04/01/19 12:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		103	70-130		
Benzene		10	0.50	ug/L	10		101	70-130		
Bromobenzene		10	1.0	ug/L	10		100	70-130		
Bromochloromethane		11	1.0	ug/L	10		107	70-130		
Bromodichloromethane		11	1.0	ug/L	10		108	70-130		
Bromoform		9.5	1.0	ug/L	10		95	70-130		
Bromomethane	L3, V4, Z-01	5.5	2.0	ug/L	10		55	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		114	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		9.9	0.50	ug/L	10		99	70-130		
Chloroethane		10	1.0	ug/L	10		104	70-130		
Chloroform		11	1.0	ug/L	10		105	70-130		
Chloromethane		8.1	1.0	ug/L	10		81	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130		
Dibromomethane		11	1.0	ug/L	10		106	70-130		
Dichlorodifluoromethane		8.2	1.0	ug/L	10		82	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		109	70-130		
Ethyl ether		9.9	1.0	ug/L	10		99	70-130		
Ethylbenzene		10	1.0	ug/L	10		100	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10		104	70-130		
Isopropylbenzene		10	1.0	ug/L	10		101	70-130		
Methyl ethyl ketone (MEK)		51	10	ug/L	50		102	70-130		
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50		101	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		105	70-130		
Methylene chloride		11	1.0	ug/L	10		105	70-130		
Naphthalene		9.7	1.0	ug/L	10		97	70-130		
n-Butylbenzene		11	1.0	ug/L	10		107	70-130		
n-Propylbenzene		10	1.0	ug/L	10		101	70-130		
o-Xylene		9.6	1.0	ug/L	10		96	70-130		
p&m-Xylene		10	1.0	ug/L	10		100	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10		100	70-130		
sec-Butylbenzene		10	1.0	ug/L	10		101	70-130		
Styrene		9.6	1.0	ug/L	10		96	70-130		
tert-Butylbenzene		9.9	1.0	ug/L	10		99	70-130		

FINAL REPORT

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

LCS (B9D0001-BS1)

Prepared: 04/01/19 12:44 Analyzed: 04/01/19 12:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		102	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100		101	70-130		
Toluene		9.7	1.0	ug/L	10		97	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10		108	70-130		
Vinyl chloride		9.5	0.050	ug/L	10		95	70-130		

LCS Dup (B9D0001-BSD1)

Prepared: 04/01/19 13:12 Analyzed: 04/01/19 13:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		97	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		101	70-130	1	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	1	30
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130	3	30
1,1,2-Trichloroethane		9.7	0.50	ug/L	10		97	70-130	5	30
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		104	70-130	4	30
1,1-Dichloroethane		10	1.0	ug/L	10		101	70-130	3	30
1,1-Dichloroethene		10	1.0	ug/L	10		102	70-130	2	30
1,1-Dichloropropene		11	1.0	ug/L	10		105	70-130	1	30
1,2,3-Trichlorobenzene		10	1.0	ug/L	10		100	70-130	2	30
1,2,3-Trichloropropane		9.4	0.20	ug/L	10		94	70-130	3	30
1,2,4-Trichlorobenzene		9.9	1.0	ug/L	10		99	70-130	0.6	30
1,2,4-Trimethylbenzene		9.6	1.0	ug/L	10		96	70-130	3	30
1,2-Dibromo-3-chloropropane (DBCP)		9.3	1.0	ug/L	10		93	70-130	5	30
1,2-Dibromoethane (EDB)		9.4	0.50	ug/L	10		94	70-130	5	30
1,2-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	2	30
1,2-Dichloroethane		10	0.20	ug/L	10		103	70-130	3	30
1,2-Dichloropropane		10	1.0	ug/L	10		103	70-130	2	30
1,3,5-Trimethylbenzene		9.4	1.0	ug/L	10		94	70-130	3	30
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	3	30

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

LCS Dup (B9D0001-BSD1)

Prepared: 04/01/19 13:12 Analyzed: 04/01/19 13:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		9.8	1.0	ug/L	10		98	70-130	0.2	30
1,4-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
2,2-Dichloropropane		11	1.0	ug/L	10		109	70-130	5	30
2-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130	2	30
4-Chlorotoluene		9.5	1.0	ug/L	10		95	70-130	3	30
Acetone		100	20	ug/L	100		101	70-130	0.4	30
Allyl chloride		9.6	1.0	ug/L	10		96	70-130	7	30
Benzene		10	0.50	ug/L	10		100	70-130	2	30
Bromobenzene		9.5	1.0	ug/L	10		95	70-130	5	30
Bromochloromethane		10	1.0	ug/L	10		102	70-130	6	30
Bromodichloromethane		10	1.0	ug/L	10		103	70-130	5	30
Bromoform		9.2	1.0	ug/L	10		92	70-130	3	30
Bromomethane	L3, V4, Z-01	5.8	2.0	ug/L	10		58	70-130	4	30
Carbon tetrachloride		11	0.20	ug/L	10		111	70-130	3	30
Chlorobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
Chlorodibromomethane		9.4	0.50	ug/L	10		94	70-130	5	30
Chloroethane		10	1.0	ug/L	10		101	70-130	4	30
Chloroform		10	1.0	ug/L	10		102	70-130	3	30
Chloromethane		7.8	1.0	ug/L	10		78	70-130	3	30
cis-1,2-Dichloroethene		9.9	1.0	ug/L	10		99	70-130	5	30
cis-1,3-Dichloropropene		9.6	0.50	ug/L	10		96	70-130	5	30
Dibromomethane		10	1.0	ug/L	10		105	70-130	1	30
Dichlorodifluoromethane		7.9	1.0	ug/L	10		79	70-130	4	30
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130	2	30
Ethyl ether		9.8	1.0	ug/L	10		98	70-130	1	30
Ethylbenzene		9.5	1.0	ug/L	10		95	70-130	6	30
Hexachlorobutadiene		10	0.50	ug/L	10		100	70-130	4	30
Isopropylbenzene		9.6	1.0	ug/L	10		96	70-130	5	30
Methyl ethyl ketone (MEK)		51	10	ug/L	50		102	70-130	0.5	30
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130	1	30
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		101	70-130	3	30
Methylene chloride		10	1.0	ug/L	10		102	70-130	3	30
Naphthalene		9.6	1.0	ug/L	10		96	70-130	2	30
n-Butylbenzene		10	1.0	ug/L	10		103	70-130	3	30
n-Propylbenzene		9.9	1.0	ug/L	10		99	70-130	2	30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

LCS Dup (B9D0001-BSD1)

Prepared: 04/01/19 13:12 Analyzed: 04/01/19 13:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		9.4	1.0	ug/L	10		94	70-130	2	30
p&m-Xylene		9.7	1.0	ug/L	10		97	70-130	4	30
p-Isopropyltoluene		9.9	1.0	ug/L	10		99	70-130	1	30
sec-Butylbenzene		9.8	1.0	ug/L	10		98	70-130	3	30
Styrene		9.0	1.0	ug/L	10		90	70-130	6	30
tert-Butylbenzene		9.7	1.0	ug/L	10		97	70-130	2	30
Tetrachloroethene		9.8	1.0	ug/L	10		98	70-130	3	30
Tetrahydrofuran (THF)		100	10	ug/L	100		102	70-130	0.6	30
Toluene		9.4	1.0	ug/L	10		94	70-130	3	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130	2	30
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130	3	30
Trichloroethene (TCE)		9.8	0.10	ug/L	10		98	70-130	3	30
Trichlorofluoromethane		10	1.0	ug/L	10		103	70-130	4	30
Vinyl chloride		9.1	0.050	ug/L	10		91	70-130	5	30

Duplicate (B9D0001-DUP1)

Source: 19C1238-15

Prepared: 04/01/19 16:26 Analyzed: 04/01/19 16:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		104	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		98	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		0.60	1.0	ug/L		<			3	30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

Duplicate (B9D0001-DUP1)

Source: 19C1238-15

Prepared: 04/01/19 16:26 Analyzed: 04/01/19 16:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		0.26	1.0	ug/L		<			8	30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		0.21	0.50	ug/L		<			5	30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane	L3, V4, Z-01	<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		0.28	1.0	ug/L		<			15	30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		<	1.0	ug/L		<				30
cis-1,2-Dichloroethene		0.67	1.0	ug/L		<			1	30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		0.61	1.0	ug/L		<			6	30
Ethyl ether		47	1.0	ug/L		47			0.4	30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

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Batch B9D0001 - EPA 5030B Preparation

Duplicate (B9D0001-DUP1)		Source: 19C1238-15		Prepared: 04/01/19 16:26 Analyzed: 04/01/19 16:26						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		0.91	1.0	ug/L		1.0			9	30
Tetrahydrofuran (THF)		<	10	ug/L		<				30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		0.56	0.10	ug/L		0.56			0	30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		0.090	0.050	ug/L		0.090			0	30

Matrix Spike (B9D0001-MS1)		Source: 19C1238-13		Prepared: 04/01/19 13:40 Analyzed: 04/01/19 13:40						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		95	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10	<	105	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	114	70-130		
1,1,2,2-Tetrachloroethane		9.6	0.50	ug/L	10	<	96	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10	<	104	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10	<	118	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	109	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	112	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10	<	112	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

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Batch B9D0001 - EPA 5030B Preparation

Matrix Spike (B9D0001-MS1)		Source: 19C1238-13		Prepared: 04/01/19 13:40		Analyzed: 04/01/19 13:40		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,3-Trichloropropane		9.7	0.20	ug/L	10	<	97	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10	<	103	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.2	1.0	ug/L	10	<	92	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	100	70-130		
1,2-Dichlorobenzene		10	1.0	ug/L	10	<	101	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10	<	107	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10	<	108	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	101	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10	<	102	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10	<	103	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	122	70-130		
2-Chlorotoluene		10	1.0	ug/L	10	<	103	70-130		
4-Chlorotoluene		10	1.0	ug/L	10	<	102	70-130		
Acetone		96	20	ug/L	100	<	96	70-130		
Allyl chloride		11	1.0	ug/L	10	<	107	70-130		
Benzene		11	0.50	ug/L	10	<	107	70-130		
Bromobenzene		10	1.0	ug/L	10	<	100	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	109	70-130		
Bromodichloromethane		11	1.0	ug/L	10	<	109	70-130		
Bromoform		9.5	1.0	ug/L	10	<	95	70-130		
Bromomethane	L3, V4, Z-01a	6.6	2.0	ug/L	10	<	66	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	122	70-130		
Chlorobenzene		10	1.0	ug/L	10	<	105	70-130		
Chlorodibromomethane		9.8	0.50	ug/L	10	<	98	70-130		
Chloroethane		11	1.0	ug/L	10	<	111	70-130		
Chloroform		11	1.0	ug/L	10	<	112	70-130		
Chloromethane		8.5	1.0	ug/L	10	<	85	70-130		
cis-1,2-Dichloroethene		11	1.0	ug/L	10	<	107	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10	<	103	70-130		
Dibromomethane		11	1.0	ug/L	10	<	109	70-130		
Dichlorodifluoromethane		9.1	1.0	ug/L	10	<	91	70-130		
Dichlorofluoromethane		12	1.0	ug/L	10	<	116	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0001 - EPA 5030B Preparation

Matrix Spike (B9D0001-MS1)		Source: 19C1238-13		Prepared: 04/01/19 13:40		Analyzed: 04/01/19 13:40		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ethyl ether		10	1.0	ug/L	10	<	101	70-130		
Ethylbenzene		10	1.0	ug/L	10	<	105	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10	<	110	70-130		
Isopropylbenzene		11	1.0	ug/L	10	<	107	70-130		
Methyl ethyl ketone (MEK)		48	10	ug/L	50	<	96	70-130		
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50	<	99	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10	<	105	70-130		
Methylene chloride		11	1.0	ug/L	10	<	108	70-130		
Naphthalene		9.5	1.0	ug/L	10	<	95	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	112	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	108	70-130		
o-Xylene		10	1.0	ug/L	10	<	100	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	105	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10	<	106	70-130		
sec-Butylbenzene		11	1.0	ug/L	10	<	108	70-130		
Styrene		9.8	1.0	ug/L	10	<	98	70-130		
tert-Butylbenzene		10	1.0	ug/L	10	<	104	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	108	70-130		
Tetrahydrofuran (THF)		96	10	ug/L	100	<	96	70-130		
Toluene		10	1.0	ug/L	10	<	104	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	110	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10	<	104	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	108	70-130		
Trichlorofluoromethane		12	1.0	ug/L	10	<	117	70-130		
Vinyl chloride		10	0.050	ug/L	10	<	104	70-130		

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)		Prepared: 04/02/19 12:49		Analyzed: 04/02/19 12:49		RPD	RPD Limit			
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)

Prepared: 04/02/19 12:49 Analyzed: 04/02/19 12:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						
Bromomethane	L3, V4, Z-01	<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)

Prepared: 04/02/19 12:49 Analyzed: 04/02/19 12:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		96	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		101	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10		109	70-130		
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10		101	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		109	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10		105	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10		106	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		108	70-130		
1,2,3-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2,3-Trichloropropane		9.3	0.20	ug/L	10		93	70-130		
1,2,4-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2,4-Trimethylbenzene		9.7	1.0	ug/L	10		97	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.0	1.0	ug/L	10		90	70-130		
1,2-Dibromoethane (EDB)		9.5	0.50	ug/L	10		95	70-130		
1,2-Dichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10		105	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10		106	70-130		
1,3,5-Trimethylbenzene		9.8	1.0	ug/L	10		98	70-130		
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10		100	70-130		
1,4-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		114	70-130		
2-Chlorotoluene		9.7	1.0	ug/L	10		97	70-130		
4-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130		
Acetone		97	20	ug/L	100		97	70-130		
Allyl chloride		10	1.0	ug/L	10		101	70-130		
Benzene		10	0.50	ug/L	10		103	70-130		
Bromobenzene		9.5	1.0	ug/L	10		95	70-130		
Bromochloromethane		11	1.0	ug/L	10		106	70-130		
Bromodichloromethane		11	1.0	ug/L	10		107	70-130		
Bromoform		10	1.0	ug/L	10		100	70-130		

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane	L3, V4, Z-01	5.8	2.0	ug/L	10		58	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		114	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		9.7	0.50	ug/L	10		97	70-130		
Chloroethane		11	1.0	ug/L	10		106	70-130		
Chloroform		11	1.0	ug/L	10		107	70-130		
Chloromethane		8.4	1.0	ug/L	10		84	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130		
Dibromomethane		10	1.0	ug/L	10		104	70-130		
Dichlorodifluoromethane		8.3	1.0	ug/L	10		83	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		110	70-130		
Ethyl ether		10	1.0	ug/L	10		101	70-130		
Ethylbenzene		10	1.0	ug/L	10		100	70-130		
Hexachlorobutadiene		9.9	0.50	ug/L	10		99	70-130		
Isopropylbenzene		10	1.0	ug/L	10		100	70-130		
Methyl ethyl ketone (MEK)		49	10	ug/L	50		99	70-130		
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		104	70-130		
Methylene chloride		10	1.0	ug/L	10		105	70-130		
Naphthalene		9.2	1.0	ug/L	10		92	70-130		
n-Butylbenzene		10	1.0	ug/L	10		104	70-130		
n-Propylbenzene		10	1.0	ug/L	10		100	70-130		
o-Xylene		9.6	1.0	ug/L	10		96	70-130		
p&m-Xylene		10	1.0	ug/L	10		101	70-130		
p-Isopropyltoluene		9.9	1.0	ug/L	10		99	70-130		
sec-Butylbenzene		10	1.0	ug/L	10		100	70-130		
Styrene		9.3	1.0	ug/L	10		93	70-130		
tert-Butylbenzene		9.7	1.0	ug/L	10		97	70-130		
Tetrachloroethene		10	1.0	ug/L	10		103	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100		101	70-130		
Toluene		9.9	1.0	ug/L	10		99	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130		
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		11	1.0	ug/L	10		109	70-130		
Vinyl chloride		9.8	0.050	ug/L	10		98	70-130		

LCS Dup (B9D0019-BS1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		97	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		100	70-130	0.6	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	3	30
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10		95	70-130	1	30
1,1,2-Trichloroethane		10	0.50	ug/L	10		103	70-130	2	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		108	70-130	1	30
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130	1	30
1,1-Dichloroethene		10	1.0	ug/L	10		102	70-130	4	30
1,1-Dichloropropene		11	1.0	ug/L	10		107	70-130	1	30
1,2,3-Trichlorobenzene		9.7	1.0	ug/L	10		97	70-130	0.5	30
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130	2	30
1,2,4-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130	0.6	30
1,2,4-Trimethylbenzene		9.4	1.0	ug/L	10		94	70-130	2	30
1,2-Dibromo-3-chloropropane (DBCP)		9.3	1.0	ug/L	10		93	70-130	3	30
1,2-Dibromoethane (EDB)		9.6	0.50	ug/L	10		96	70-130	0.5	30
1,2-Dichlorobenzene		9.5	1.0	ug/L	10		95	70-130	0.5	30
1,2-Dichloroethane		11	0.20	ug/L	10		106	70-130	0.7	30
1,2-Dichloropropane		10	1.0	ug/L	10		105	70-130	1	30
1,3,5-Trimethylbenzene		9.5	1.0	ug/L	10		95	70-130	2	30
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	0.7	30
1,3-Dichloropropane		10	1.0	ug/L	10		101	70-130	2	30
1,4-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	3	30
2,2-Dichloropropane		11	1.0	ug/L	10		108	70-130	5	30
2-Chlorotoluene		9.7	1.0	ug/L	10		97	70-130	0.1	30
4-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130	0.8	30
Acetone		94	20	ug/L	100		94	70-130	3	30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS Dup (B9D0019-BSD1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		9.9	1.0	ug/L	10		99	70-130	3	30
Benzene		10	0.50	ug/L	10		102	70-130	2	30
Bromobenzene		9.6	1.0	ug/L	10		96	70-130	0.3	30
Bromochloromethane		10	1.0	ug/L	10		104	70-130	1	30
Bromodichloromethane		10	1.0	ug/L	10		104	70-130	3	30
Bromoform		9.8	1.0	ug/L	10		98	70-130	2	30
Bromomethane	L3, V4, Z-01	6.4	2.0	ug/L	10		64	70-130	10	30
Carbon tetrachloride		11	0.20	ug/L	10		112	70-130	2	30
Chlorobenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Chlorodibromomethane		9.8	0.50	ug/L	10		98	70-130	1	30
Chloroethane		10	1.0	ug/L	10		102	70-130	4	30
Chloroform		10	1.0	ug/L	10		104	70-130	3	30
Chloromethane		8.3	1.0	ug/L	10		83	70-130	0.7	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130	1	30
cis-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130	2	30
Dibromomethane		11	1.0	ug/L	10		106	70-130	2	30
Dichlorodifluoromethane		8.0	1.0	ug/L	10		80	70-130	3	30
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130	2	30
Ethyl ether		9.9	1.0	ug/L	10		99	70-130	2	30
Ethylbenzene		10	1.0	ug/L	10		100	70-130	0.2	30
Hexachlorobutadiene		9.9	0.50	ug/L	10		99	70-130	0.1	30
Isopropylbenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Methyl ethyl ketone (MEK)		48	10	ug/L	50		96	70-130	3	30
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130	0.1	30
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10		106	70-130	2	30
Methylene chloride		10	1.0	ug/L	10		104	70-130	1	30
Naphthalene		9.4	1.0	ug/L	10		94	70-130	2	30
n-Butylbenzene		10	1.0	ug/L	10		103	70-130	1	30
n-Propylbenzene		10	1.0	ug/L	10		100	70-130	0.1	30
o-Xylene		9.6	1.0	ug/L	10		96	70-130	0.1	30
p&m-Xylene		10	1.0	ug/L	10		101	70-130	0.3	30
p-Isopropyltoluene		9.8	1.0	ug/L	10		98	70-130	1	30
sec-Butylbenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Styrene		9.5	1.0	ug/L	10		95	70-130	1	30
tert-Butylbenzene		9.6	1.0	ug/L	10		96	70-130	1	30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS Dup (B9D0019-BSD1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		9.9	1.0	ug/L	10		99	70-130	4	30
Tetrahydrofuran (THF)		99	10	ug/L	100		99	70-130	2	30
Toluene		9.8	1.0	ug/L	10		98	70-130	2	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130	2	30
trans-1,3-Dichloropropene		10	0.50	ug/L	10		103	70-130	5	30
Trichloroethene (TCE)		9.8	0.10	ug/L	10		98	70-130	3	30
Trichlorofluoromethane		10	1.0	ug/L	10		105	70-130	4	30
Vinyl chloride		9.4	0.050	ug/L	10		94	70-130	3	30

Duplicate (B9D0019-DUP1)

Source: 19C1274-05

Prepared: 04/02/19 14:13 Analyzed: 04/02/19 14:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Duplicate (B9D0019-DUP1)

Source: 19C1274-05

Prepared: 04/02/19 14:13 Analyzed: 04/02/19 14:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		<	1.0	ug/L		<				30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		<	0.50	ug/L		<				30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane	L3, V4, Z-01	<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		<	1.0	ug/L		<				30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		<	1.0	ug/L		<				30
cis-1,2-Dichloroethene		<	1.0	ug/L		<				30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		<	1.0	ug/L		<				30
Ethyl ether		3.1	1.0	ug/L		3.1			0	30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Duplicate (B9D0019-DUP1)		Source: 19C1274-05		Prepared: 04/02/19 14:13 Analyzed: 04/02/19 14:13						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		2.8	10	ug/L		<			1	30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		<	0.10	ug/L		<				30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		<	0.050	ug/L		<				30

Matrix Spike (B9D0019-MS1)		Source: 19C1274-04		Prepared: 04/02/19 11:26 Analyzed: 04/02/19 11:26						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		94	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		11	1.0	ug/L	10	<	105	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	115	70-130		
1,1,2,2-Tetrachloroethane		9.8	0.50	ug/L	10	<	98	70-130		
1,1,2-Trichloroethane		11	0.50	ug/L	10	<	106	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10	<	118	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	111	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	114	70-130		
1,1-Dichloropropene		12	1.0	ug/L	10	<	117	70-130		
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2,3-Trichloropropane		9.7	0.20	ug/L	10	<	97	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	101	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10	<	101	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.0	1.0	ug/L	10	<	90	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Matrix Spike (B9D0019-MS1)		Source: 19C1274-04		Prepared: 04/02/19 11:26		Analyzed: 04/02/19 11:26		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	104	70-130		
1,2-Dichlorobenzene		9.9	1.0	ug/L	10	<	99	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10	<	112	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10	<	113	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichloropropane		11	1.0	ug/L	10	<	105	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10	<	104	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	123	70-130		
2-Chlorotoluene		10	1.0	ug/L	10	<	101	70-130		
4-Chlorotoluene		10	1.0	ug/L	10	<	101	70-130		
Acetone		95	20	ug/L	100	<	95	70-130		
Allyl chloride		11	1.0	ug/L	10	<	110	70-130		
Benzene		11	0.50	ug/L	10	<	110	70-130		
Bromobenzene		9.8	1.0	ug/L	10	<	98	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	110	70-130		
Bromodichloromethane		11	1.0	ug/L	10	<	111	70-130		
Bromoform		10	1.0	ug/L	10	<	101	70-130		
Bromomethane	L3, V4, Z-01	7.3	2.0	ug/L	10	<	73	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	122	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	107	70-130		
Chlorodibromomethane		10	0.50	ug/L	10	<	101	70-130		
Chloroethane		11	1.0	ug/L	10	<	112	70-130		
Chloroform		11	1.0	ug/L	10	<	114	70-130		
Chloromethane		9.3	1.0	ug/L	10	<	93	70-130		
cis-1,2-Dichloroethene		11	1.0	ug/L	10	<	109	70-130		
cis-1,3-Dichloropropene		11	0.50	ug/L	10	<	106	70-130		
Dibromomethane		11	1.0	ug/L	10	<	112	70-130		
Dichlorodifluoromethane		9.0	1.0	ug/L	10	<	90	70-130		
Dichlorofluoromethane		12	1.0	ug/L	10	<	118	70-130		
Ethyl ether		13	1.0	ug/L	10	3.3	102	70-130		
Ethylbenzene		11	1.0	ug/L	10	<	105	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10	<	104	70-130		
Isopropylbenzene		11	1.0	ug/L	10	<	108	70-130		
Methyl ethyl ketone (MEK)		49	10	ug/L	50	<	99	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Matrix Spike (B9D0019-MS1)

Source: 19C1274-04

Prepared: 04/02/19 11:26 Analyzed: 04/02/19 11:26

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50	<	103	70-130		
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10	<	110	70-130		
Methylene chloride		11	1.0	ug/L	10	<	113	70-130		
Naphthalene		9.6	1.0	ug/L	10	<	96	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	111	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	106	70-130		
o-Xylene		10	1.0	ug/L	10	<	103	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	105	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10	<	104	70-130		
sec-Butylbenzene		11	1.0	ug/L	10	<	106	70-130		
Styrene		9.9	1.0	ug/L	10	<	99	70-130		
tert-Butylbenzene		10	1.0	ug/L	10	<	102	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	106	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100	<	98	70-130		
Toluene		10	1.0	ug/L	10	<	104	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	111	70-130		
trans-1,3-Dichloropropene		11	0.50	ug/L	10	<	107	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	108	70-130		
Trichlorofluoromethane		12	1.0	ug/L	10	<	116	70-130		
Vinyl chloride		11	0.050	ug/L	10	<	106	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0396 - 1,4 Dioxane in Water SPE

Blank (B9D0396-BLK1)

Prepared: 04/23/19 08:00 Analyzed: 04/24/19 10:18

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.049	ug/L						

LCS (B9D0396-BS1)

Prepared: 04/23/19 08:00 Analyzed: 04/24/19 10:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.20	0.049	ug/L	0.19		103	80-120		

Duplicate (B9D0396-DUP1)

Source: 19C1238-20

Prepared: 04/23/19 08:00 Analyzed: 04/24/19 12:10

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.073	0.049	ug/L		0.067			10	30

Matrix Spike (B9D0396-MS1)

Source: 19C1238-21

Prepared: 04/23/19 08:00 Analyzed: 04/24/19 12:42

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		1.4	0.050	ug/L	0.44	0.91	110	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0148 - PFCs Preparation

Blank (B9D0148-BLK1)

Prepared: 04/08/19 15:23 Analyzed: 04/08/19 15:23

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0148-BLK2)

Prepared: 04/08/19 20:22 Analyzed: 04/08/19 20:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0148-BS1)

Prepared: 04/08/19 15:15 Analyzed: 04/08/19 15:15

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50		104	80-120		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5		104	80-120		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50		102	80-120		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		106	80-120		
Perfluorooctanesulfonate (PFOS)		0.54	0.025	ug/L	0.49		108	80-120		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5		99	80-120		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		104	80-120		

LCS Dup (B9D0148-BSD1)

Prepared: 04/08/19 20:14 Analyzed: 04/08/19 20:14

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		101	80-120	4	20
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5		103	80-120	0.4	20
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50		105	80-120	3	20

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0148 - PFCs Preparation

LCS Dup (B9D0148-BSD1)

Prepared: 04/08/19 20:14 Analyzed: 04/08/19 20:14

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5		108	80-120	2	20
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49		102	80-120	6	20
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5		104	80-120	4	20
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5		103	80-120	1	20

Duplicate (B9D0148-DUP1)

Source: 19C1190-01

Prepared: 04/08/19 15:47 Analyzed: 04/08/19 15:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)	WB, J	0.011	0.050	ug/L		<			22	20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L		<				20
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L		<				20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B9D0148-MS1)

Source: 19C1190-01

Prepared: 04/08/19 15:39 Analyzed: 04/08/19 15:39

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5	<	98	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	<	110	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0148-MS2)

Source: 19C1190-02

Prepared: 04/08/19 16:11 Analyzed: 04/08/19 16:11

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	98	70-130		
Perfluorobutanoic acid (PFBA)		0.57	0.050	ug/L	0.5	0.058	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	102	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0148 - PFCs Preparation

Matrix Spike (B9D0148-MS2) Source: 19C1190-02 Prepared: 04/08/19 16:11 Analyzed: 04/08/19 16:11

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	106	70-130		

Matrix Spike (B9D0148-MS3) Source: 19C1190-03 Prepared: 04/08/19 16:28 Analyzed: 04/08/19 16:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.48	0.050	ug/L	0.50	<	96	70-130		
Perfluorobutanoic acid (PFBA)		0.86	0.050	ug/L	0.5	0.33	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	104	70-130		
Perfluorohexanoic acid (PFHxA)		0.56	0.050	ug/L	0.5	<	109	70-130		
Perfluorooctanesulfonate (PFOS)		0.69	0.025	ug/L	0.49	0.19	101	70-130		
Perfluorooctanoic acid (PFOA)		0.61	0.035	ug/L	0.5	0.078	106	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	106	70-130		

Matrix Spike (B9D0148-MS4) Source: 19C1190-04 Prepared: 04/08/19 16:44 Analyzed: 04/08/19 16:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.48	0.025	ug/L	0.50	<	96	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.54	0.025	ug/L	0.49	<	108	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0148-MS5) Source: 19C1274-02 Prepared: 04/08/19 17:00 Analyzed: 04/08/19 17:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	107	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0148 - PFCs Preparation

Matrix Spike (B9D0148-MS6) Source: 19C1274-03 Prepared: 04/08/19 17:16 Analyzed: 04/08/19 17:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50	<	109	70-130		
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	105	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	110	70-130		

Matrix Spike (B9D0148-MS7) Source: 19C1274-04 Prepared: 04/08/19 17:32 Analyzed: 04/08/19 17:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.62	0.050	ug/L	0.5	0.10	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.56	0.025	ug/L	0.50	<	112	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.56	0.025	ug/L	0.49	0.038	104	70-130		
Perfluorooctanoic acid (PFOA)		0.63	0.035	ug/L	0.5	0.11	103	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	106	70-130		

Matrix Spike (B9D0148-MS8) Source: 19C1274-05 Prepared: 04/08/19 17:48 Analyzed: 04/08/19 17:48

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.67	0.050	ug/L	0.5	0.16	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50	<	110	70-130		
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	103	70-130		
Perfluorooctanoic acid (PFOA)		0.62	0.035	ug/L	0.5	0.083	108	70-130		
Perfluoropentanoic acid (PFPeA)		0.58	0.050	ug/L	0.5	<	112	70-130		

Matrix Spike (B9D0148-MS9) Source: 19C1281-01 Prepared: 04/08/19 18:04 Analyzed: 04/08/19 18:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	101	70-130		

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0148 - PFCs Preparation

Matrix Spike (B9D0148-MS9) Source: 19C1281-01 Prepared: 04/08/19 18:04 Analyzed: 04/08/19 18:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	<	109	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	108	70-130		

Matrix Spike (B9D0148-MSA) Source: 19C1281-02 Prepared: 04/08/19 18:21 Analyzed: 04/08/19 18:21

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	99	70-130		
Perfluorobutanoic acid (PFBA)		0.75	0.050	ug/L	0.5	0.28	93	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.55	0.050	ug/L	0.5	<	109	70-130		
Perfluorooctanesulfonate (PFOS)		0.58	0.025	ug/L	0.49	0.038	109	70-130		
Perfluorooctanoic acid (PFOA)		0.56	0.035	ug/L	0.5	0.040	103	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0148-MSB) Source: 19C1281-03 Prepared: 04/08/19 18:37 Analyzed: 04/08/19 18:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.76	0.050	ug/L	0.5	0.23	106	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	104	70-130		
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5	<	102	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	0.029	99	70-130		
Perfluorooctanoic acid (PFOA)		0.56	0.035	ug/L	0.5	0.039	104	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	109	70-130		

Matrix Spike (B9D0148-MSC) Source: 19C1281-04 Prepared: 04/08/19 18:53 Analyzed: 04/08/19 18:53

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.63	0.050	ug/L	0.5	0.11	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	101	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	107	70-130		

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0148 - PFCs Preparation

Matrix Spike (B9D0148-MSC) Source: 19C1281-04 Prepared: 04/08/19 18:53 Analyzed: 04/08/19 18:53

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	107	70-130		

Matrix Spike (B9D0148-MSD) Source: 19C1281-05 Prepared: 04/08/19 19:09 Analyzed: 04/08/19 19:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	97	70-130		
Perfluorobutanoic acid (PFBA)		0.67	0.050	ug/L	0.5	0.18	98	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.56	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.54	0.025	ug/L	0.49	<	108	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	105	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike Dup (B9D0148-MSD1) Source: 19C1190-01 Prepared: 04/08/19 15:55 Analyzed: 04/08/19 15:55

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130	2	20
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	102	70-130	4	20
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	107	70-130	7	20
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130	0.9	20
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130	6	20
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	105	70-130	5	20
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	107	70-130	2	20

Matrix Spike (B9D0148-MSE) Source: 19C1281-06 Prepared: 04/08/19 19:25 Analyzed: 04/08/19 19:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.80	0.050	ug/L	0.5	0.30	100	70-130		
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50	<	109	70-130		
Perfluorohexanoic acid (PFHxA)		0.56	0.050	ug/L	0.5	<	109	70-130		
Perfluorooctanesulfonate (PFOS)		0.58	0.025	ug/L	0.49	0.048	107	70-130		
Perfluorooctanoic acid (PFOA)		0.59	0.035	ug/L	0.5	0.053	107	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	103	70-130		

FINAL REPORT

Report ID: 04262019160231

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: SW-57
Collected By: David Anderson/Chris Pelosi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 04/26/19 16:02

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0148 - PFCs Preparation

Matrix Spike (B9D0148-MSF) Source: 19C1281-07 Prepared: 04/08/19 19:41 Analyzed: 04/08/19 19:41

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	99	70-130		
Perfluorobutanoic acid (PFBA)		0.79	0.050	ug/L	0.5	0.30	98	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.55	0.050	ug/L	0.5	<	110	70-130		
Perfluorooctanesulfonate (PFOS)		0.58	0.025	ug/L	0.49	0.061	103	70-130		
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5	0.047	102	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0148-MSG) Source: 19C1281-08 Prepared: 04/08/19 19:58 Analyzed: 04/08/19 19:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5	<	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	107	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	103	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	104	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	106	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

Z-01a	Low bias demonstrated by continuing calibration verification standard, samples may also display a low bias. Matrix spike recovery was low; the associated LCS/LCSD recovery was also low.
Z-01	Low bias demonstrated by continuing calibration verification standard, samples may also display a low bias.
WB	Relative percent difference exceeded the laboratory acceptance limit. Result less than 5 times the RL.
V4	Calibration verification standard recovery was below method acceptance limits. See comments or additional qualifiers.
L3	The spike recovery was below laboratory acceptance limits for the associated laboratory control sample and/or laboratory control sample duplicate.
J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 5/1/19
Client Name: QW - MPCA - Closed Landfill Assessment
Project Code: QW
Project Name: Closed Landfill Assessment

Work Order Number: 19D0067

Report To: QW - MPCA - Closed Landfill Assessment
Mark Umholtz
520 Lafayette Rd.
Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Moyer", is written over a light gray rectangular background.

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300
<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Work Order Comment: Project code is QW, Source for QC-FR is SP-02 per B. Scruton. -CCS 04/02/19 SP-07 1,4 dioxane container had excessive sediment, analysis cancelled, client notified. -CCS 04/26/19

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
Trip Blank 3	19D0067-01	QC-BLANK	03/29/19 7:00	04/02/19 9:40	5.0
462521	19D0067-02	Wtr-Ground	03/29/19 13:00	04/02/19 9:40	5.0
M-2	19D0067-03	Wtr-Ground	03/29/19 13:05	04/02/19 9:40	5.0
462522	19D0067-04	Wtr-Ground	03/29/19 13:50	04/02/19 9:40	5.0
813740	19D0067-05	Wtr-Ground	04/01/19 10:10	04/02/19 9:40	5.0
813764	19D0067-06	Wtr-Ground	04/01/19 10:50	04/02/19 9:40	5.0
813761	19D0067-07	Wtr-Ground	04/01/19 13:00	04/02/19 9:40	5.0
240816	19D0067-08	Wtr-Ground	04/01/19 15:10	04/02/19 9:40	5.0

Field ID	MDH Sample Number	Receiving Comments
462521	19D0067-02	Parent sample for QC-FR -CCS
813761	19D0067-07	Excessive sediment in 1,4 dioxane. -CCS

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health



Chain-of-Custody Form revision 2013.0909

Work Order Number: _____ COC Type: Standard Page: / of /

Turnaround Time: Standard COC ID: _____

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MN SW-057	Program Code (MDH Lab Only):	Lab Name: Minnesota Department of Health
Project Name: 19-01567 MPCA Freeway Landfill 2019 MDH	Project Task Code: PRJ07786	Address: 601 Robert Street N.
Project Manager: Mark Umholtz 651-757-2308		St. Paul MN 55155
Potential Hazard? If yes, add information to Sampler Comments Section		Phone No: 651-201-5058



SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				ANALYSIS REQUESTED					
Sample=Routine Sample	QC-FB=Field Blank Sample	DW=Drinking Water	AR=Air	Wtr-Ground=Groundwater	PRESERV.	HCl	None	None									
S-IVP=Integrated Vertical Profile Sample	QC-FR=Field Replicate Sample	NW=Non-potable Water	BL=Biological Material	Wtr-Surf=Surface Water													
Sample	QC-TB=Trip Blank Sample	SD=Soil/Solid	OT=Other	QC-BLANK=Artificial Blank Water													
S-CWOP=Composite Sample		WP=Wipe	TS=Tissue	Leachate=Leachate Sample													
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	VOCs EPA 8260D	PFAS by MDH555	1,4 Dioxane	Lab Sample No.	#
Trip Blank 3	QC-TB	3/29/19	0700			G	NW	Blank	N		3					-01	1
462521	Sample	3/29/19	1300			G	NW	Ground	N		5	X	X	X		-02	2
M-2	QC-FR	3/29/19	1305			G	NW	Wtr-Ground	N		5	X	X	X		-03	3
462522	Sample	3/29/19	1350			G	NW	Wtr-Ground	N		5	X	X	X		-04	4
813740	Sample	4/1/19	1010			G	NW	Wtr-Ground	N		5	X	X	X		-05	5
813764	Sample	4/1/19	1050			G	NW	Wtr-Ground	N		5	X	X	X		-06	6
813761	Sample	4/1/19	1300			G	NW	Wtr-Ground	N		5	X	X	X		-07	7
240816	Sample	4/1/19	1510			G	NW	Wtr-Ground	N		5	X	X	X		-08	8
									N								9
									N								10

Sampled By: David Anderson / Chris Relasi Sampler's Signature: David Anderson Phone #: _____

Receiving Comments: _____

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	4/1/19 / 1620	[Signature]	4/2/19 9:00 AM
[Signature]	4/2/19	[Signature]	4/2/19 9:40 AM

* sample 813761 is leachate type sample, very strong leachate odor.

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: APR 2'19 9:40

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # _____

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can
 None Other _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No Yes

Packaging, Temperature & Radiochemical Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack #(2) Gel pack #() Dry ice None
 Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 5.0 °C IR thermometer instrument used: BIO

Samples received with evidence of freezing: No; Yes _____

Rad Chem. request received: No; Yes, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Initials of person receiving parcel: MKC

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No Unknown

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Sample submission details are entered in the Environmental Laboratory LIMS.

Initials of person logging in the work order request into LIMS: MKC

Final Report
Case Narrative

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected by: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/2019 14:50

Except where noted in this report, no additional comments are needed for this Work Order.

FINAL REPORT

Report ID: 05012019145117

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-01

Location ID: Trip Blank 3	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Surrogate: 4-Bromofluorobenzene		97	70-130	%	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-01

Location ID: Trip Blank 3	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-01

Location ID: Trip Blank 3	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 14:40	04/02/19 14:40	EPA 8260D

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-02

Location ID: 462521	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Surrogate: 4-Bromofluorobenzene		100	70-130	%	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-02

Location ID: 462521	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-02

Location ID: 462521	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 15:36	04/02/19 15:36	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		3.3	0.049	ug/L	1	B9D0396	04/23/19 08:00	04/24/19 14:17	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0230	04/12/19 13:07	04/12/19 13:07	MDH 555
Perfluorobutanoic acid (PFBA)	WB, J	0.024	0.050	ug/L	1	B9D0230	04/12/19 13:07	04/12/19 13:07	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-02

Location ID: 462521	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0230	04/12/19 13:07	04/12/19 13:07	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0230	04/12/19 13:07	04/12/19 13:07	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L	1	B9D0230	04/12/19 13:07	04/12/19 13:07	MDH 555
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L	1	B9D0230	04/12/19 13:07	04/12/19 13:07	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9D0230	04/12/19 13:07	04/12/19 13:07	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-03

Location ID: M-2	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:05	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-03

Location ID: M-2	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:05	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D

FINAL REPORT

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-03

Location ID: M-2	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:05	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 16:04	04/02/19 16:04	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		3.2	0.049	ug/L	1	B9D0396	04/23/19 08:00	04/24/19 14:33	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0230	04/12/19 13:40	04/12/19 13:40	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.044	0.050	ug/L	1	B9D0230	04/12/19 13:40	04/12/19 13:40	MDH 555

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-03

Location ID: M-2	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:05	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0230	04/12/19 13:40	04/12/19 13:40	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0230	04/12/19 13:40	04/12/19 13:40	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L	1	B9D0230	04/12/19 13:40	04/12/19 13:40	MDH 555
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L	1	B9D0230	04/12/19 13:40	04/12/19 13:40	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9D0230	04/12/19 13:40	04/12/19 13:40	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-04

Location ID: 462522	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		103	70-130	%	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Surrogate: 4-Bromofluorobenzene		99	70-130	%	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-04

Location ID: 462522	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-04

Location ID: 462522	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 16:32	04/02/19 16:32	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		3.8	0.050	ug/L	1	B9D0396	04/23/19 08:00	04/24/19 14:49	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0230	04/12/19 13:56	04/12/19 13:56	MDH 555
Perfluorobutanoic acid (PFBA)		0.056	0.050	ug/L	1	B9D0230	04/12/19 13:56	04/12/19 13:56	MDH 555

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-04

Location ID: 462522	Collect Date: 03/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0230	04/12/19 13:56	04/12/19 13:56	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.024	0.050	ug/L	1	B9D0230	04/12/19 13:56	04/12/19 13:56	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L	1	B9D0230	04/12/19 13:56	04/12/19 13:56	MDH 555
Perfluorooctanoic acid (PFOA)		0.068	0.035	ug/L	1	B9D0230	04/12/19 13:56	04/12/19 13:56	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.010	0.050	ug/L	1	B9D0230	04/12/19 13:56	04/12/19 13:56	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-05

Location ID: 813740	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
1,4-Dichlorobenzene		1.6	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-05

Location ID: 813740	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Benzene		0.72	0.50	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Chlorobenzene		5.6	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Ethyl ether		12	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-05

Location ID: 813740	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Tetrahydrofuran (THF)		39	10	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 17:00	04/02/19 17:00	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		0.066	0.050	ug/L	1	B9D0230	04/12/19 14:12	04/12/19 14:12	MDH 555
Perfluorobutanoic acid (PFBA)		0.78	0.050	ug/L	1	B9D0230	04/12/19 14:12	04/12/19 14:12	MDH 555
Perfluorohexanesulfonate (PFHxS)		0.087	0.025	ug/L	1	B9D0230	04/12/19 14:12	04/12/19 14:12	MDH 555
Perfluorohexanoic acid (PFHxA)		0.30	0.050	ug/L	1	B9D0230	04/12/19 14:12	04/12/19 14:12	MDH 555
Perfluorooctanesulfonate (PFOS)		0.063	0.025	ug/L	1	B9D0230	04/12/19 14:12	04/12/19 14:12	MDH 555
Perfluorooctanoic acid (PFOA)		0.20	0.035	ug/L	1	B9D0230	04/12/19 14:12	04/12/19 14:12	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-05

Location ID: 813740	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluoropentanoic acid (PFPeA)		0.24	0.050	ug/L	1	B9D0230	04/12/19 14:12	04/12/19 14:12	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51


MDH Sample Number: 19D0067-05RE1

Location ID: 813740	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

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1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	40	0.25	ug/L	5	B9D0423	04/24/19 08:00	04/28/19 21:11	EPA 522 Modified

Authorized by:  <hr/> Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health	<i>The results in this report apply only to the samples analyzed. This report must not be reproduced, except in full, without the written approval of the laboratory.</i>
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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-06

Location ID: 813764	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		103	70-130	%	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
1,4-Dichlorobenzene		2.8	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-06

Location ID: 813764	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Benzene		2.8	0.50	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Bromomethane	L3, V4, Z-01	<	2.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Chlorobenzene		5.6	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Ethyl ether		19	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Isopropylbenzene		1.4	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-06

Location ID: 813764	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Naphthalene		2.0	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
n-Propylbenzene		1.3	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
o-Xylene		1.4	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Tetrahydrofuran (THF)		110	10	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 17:28	04/02/19 17:28	EPA 8260D

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51


MDH Sample Number: 19D0067-06RE1

Location ID: 813764	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	98	0.51	ug/L	10	B9D0423	04/24/19 08:00	04/28/19 21:27	EPA 522 Modified

Authorized by:  <hr/> Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health	<i>The results in this report apply only to the samples analyzed. This report must not be reproduced, except in full, without the written approval of the laboratory.</i>
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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-06RE3

Location ID: 813764	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	D1, H2, J	0.17	0.25	ug/L	5	B9D0364	04/19/19 11:45	04/19/19 11:45	MDH 555
Perfluorobutanoic acid (PFBA)	D1, H2	1.9	0.25	ug/L	5	B9D0364	04/19/19 11:45	04/19/19 11:45	MDH 555
Perfluorohexanesulfonate (PFHxS)	D1, H2	0.27	0.12	ug/L	5	B9D0364	04/19/19 11:45	04/19/19 11:45	MDH 555
Perfluorohexanoic acid (PFHxA)	D1, H2	0.84	0.25	ug/L	5	B9D0364	04/19/19 11:45	04/19/19 11:45	MDH 555
Perfluorooctanesulfonate (PFOS)	D1, H2	0.21	0.12	ug/L	5	B9D0364	04/19/19 11:45	04/19/19 11:45	MDH 555
Perfluorooctanoic acid (PFOA)	D1, H2	0.77	0.18	ug/L	5	B9D0364	04/19/19 11:45	04/19/19 11:45	MDH 555
Perfluoropentanoic acid (PFPeA)	D1, H2	0.73	0.25	ug/L	5	B9D0364	04/19/19 11:45	04/19/19 11:45	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-07

Location ID: 813761	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: Excessive sediment in 1,4 dioxane. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	D1, J	0.067	0.25	ug/L	5	B9D0230	04/12/19 14:44	04/12/19 14:44	MDH 555
Perfluorobutanoic acid (PFBA)	D1	4.0	0.25	ug/L	5	B9D0230	04/12/19 14:44	04/12/19 14:44	MDH 555
Perfluorohexanesulfonate (PFHxS)	D1	0.26	0.12	ug/L	5	B9D0230	04/12/19 14:44	04/12/19 14:44	MDH 555
Perfluorohexanoic acid (PFHxA)	D1	0.80	0.25	ug/L	5	B9D0230	04/12/19 14:44	04/12/19 14:44	MDH 555
Perfluorooctanesulfonate (PFOS)	D1	0.48	0.12	ug/L	5	B9D0230	04/12/19 14:44	04/12/19 14:44	MDH 555
Perfluorooctanoic acid (PFOA)	D1	0.53	0.18	ug/L	5	B9D0230	04/12/19 14:44	04/12/19 14:44	MDH 555
Perfluoropentanoic acid (PFPeA)	D1	0.59	0.25	ug/L	5	B9D0230	04/12/19 14:44	04/12/19 14:44	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-07RE1

Location ID: 813761	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: Excessive sediment in 1,4 dioxane. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4	F5	102	70-130	%	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Surrogate: 4-Bromofluorobenzene	F5	99	70-130	%	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3	F5	101	70-130	%	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,1,1,2-Tetrachloroethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,1,1-Trichloroethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,1,2,2-Tetrachloroethane	D2, F5	<	5.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,1,2-Trichloroethane	D2, F5	<	5.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,1,2-Trichlorotrifluoroethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,1-Dichloroethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,1-Dichloroethene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,1-Dichloropropene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2,3-Trichlorobenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2,3-Trichloropropane	D2, F5	<	2.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2,4-Trichlorobenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2,4-Trimethylbenzene	D2, F5	72	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2-Dibromoethane (EDB)	D2, F5	<	5.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2-Dichlorobenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2-Dichloroethane	D2, F5	<	2.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,2-Dichloropropane	F5, D2	13	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,3,5-Trimethylbenzene	D2, F5	22	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,3-Dichlorobenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,3-Dichloropropane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
1,4-Dichlorobenzene	D2, F5	16	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
2,2-Dichloropropane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
2-Chlorotoluene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-07RE1

Location ID: 813761	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: Excessive sediment in 1,4 dioxane. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Allyl chloride	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Benzene	D2, F5	16	5.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Bromobenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Bromochloromethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Bromodichloromethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Bromoform	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Bromomethane	F5, L3, V4, Z-01, D2	<	20	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Carbon tetrachloride	D2, F5	<	2.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Chlorobenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Chlorodibromomethane	D2, F5	<	5.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Chloroethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Chloroform	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Chloromethane	F5, D2	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
cis-1,2-Dichloroethene	D2, F5	440	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
cis-1,3-Dichloropropene	D2, F5	<	5.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Dibromomethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Dichlorodifluoromethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Dichlorofluoromethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Ethyl ether	D2, F5	50	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Ethylbenzene	D2, F5	120	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Hexachlorobutadiene	D2, F5	<	5.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Isopropylbenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Methyl tertiary butyl ether (MTBE)	D2, F5	<	20	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Methylene chloride	D2, F5	39	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Naphthalene	D2, F5	18	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
n-Butylbenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-07RE1

Location ID: 813761	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: Excessive sediment in 1,4 dioxane. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
n-Propylbenzene	D2, F5	13	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
o-Xylene	D2, F5	110	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
p&m-Xylene	D2, F5	300	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
p-Isopropyltoluene	D2, F5	27	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
sec-Butylbenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Styrene	D2, F5	30	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
tert-Butylbenzene	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Tetrachloroethene	D2, F5	100	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Tetrahydrofuran (THF)	D2, F5	420	100	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
trans-1,2-Dichloroethene	D2, F5	12	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
trans-1,3-Dichloropropene	D2, F5	<	5.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Trichloroethene (TCE)	D2, F5	150	1.0	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Trichlorofluoromethane	D2, F5	<	10	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D
Vinyl chloride	D2, F5	32	0.50	ug/L	1	B9D0019	04/02/19 18:24	04/02/19 18:24	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-07RE2

Location ID: 813761	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: Excessive sediment in 1,4 dioxane. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4	F5	102	70-130	%	1	B9D0043	04/03/19 16:41	04/03/19 16:41	EPA 8260D
Surrogate: 4-Bromofluorobenzene	F5	97	70-130	%	1	B9D0043	04/03/19 16:41	04/03/19 16:41	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3	F5	102	70-130	%	1	B9D0043	04/03/19 16:41	04/03/19 16:41	EPA 8260D
Acetone	D2, F5	8600	2000	ug/L	1	B9D0043	04/03/19 16:41	04/03/19 16:41	EPA 8260D
Methyl ethyl ketone (MEK)	D2, F5	14000	1000	ug/L	1	B9D0043	04/03/19 16:41	04/03/19 16:41	EPA 8260D
Methyl isobutyl ketone (MIBK)	D2, F5	1400	500	ug/L	1	B9D0043	04/03/19 16:41	04/03/19 16:41	EPA 8260D
Toluene	D2, F5	610	100	ug/L	1	B9D0043	04/03/19 16:41	04/03/19 16:41	EPA 8260D

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-08

Location ID: 240816	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Surrogate: 4-Bromofluorobenzene		98	70-130	%	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-08

Location ID: 240816	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

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VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Acetone		<	20	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Bromomethane	V4, Z-01, L3	<	2.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-08

Location ID: 240816	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0019	04/02/19 17:56	04/02/19 17:56	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		1.2	0.050	ug/L	1	B9D0423	04/24/19 08:00	04/26/19 12:59	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.011	0.050	ug/L	1	B9D0230	04/12/19 15:01	04/12/19 15:01	MDH 555
Perfluorobutanoic acid (PFBA)		0.088	0.050	ug/L	1	B9D0230	04/12/19 15:01	04/12/19 15:01	MDH 555

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

MDH Sample Number: 19D0067-08

Location ID: 240816	Collect Date: 04/01/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:10	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		0.029	0.025	ug/L	1	B9D0230	04/12/19 15:01	04/12/19 15:01	MDH 555
Perfluorohexanoic acid (PFHxA)		0.051	0.050	ug/L	1	B9D0230	04/12/19 15:01	04/12/19 15:01	MDH 555
Perfluorooctanesulfonate (PFOS)		0.046	0.025	ug/L	1	B9D0230	04/12/19 15:01	04/12/19 15:01	MDH 555
Perfluorooctanoic acid (PFOA)		0.061	0.035	ug/L	1	B9D0230	04/12/19 15:01	04/12/19 15:01	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.049	0.050	ug/L	1	B9D0230	04/12/19 15:01	04/12/19 15:01	MDH 555

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Batch Summary

Samples in Batch: B9D0019 - EPA 5030B Preparation

19D0067-01 19D0067-02 19D0067-03 19D0067-04 19D0067-05 19D0067-06 19D0067-07RE1
19D0067-08

Samples in Batch: B9D0043 - EPA 5030B Preparation

19D0067-07RE2

Samples in Batch: B9D0230 - PFCs Preparation

19D0067-02 19D0067-03 19D0067-04 19D0067-05 19D0067-07 19D0067-08

Samples in Batch: B9D0364 - PFCs Preparation

19D0067-06RE3

Samples in Batch: B9D0396 - 1,4 Dioxane in Water SPE

19D0067-02 19D0067-03 19D0067-04

Samples in Batch: B9D0423 - 1,4 Dioxane in Water SPE

19D0067-05RE1 19D0067-06RE1 19D0067-08

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)

Prepared: 04/02/19 12:49 Analyzed: 04/02/19 12:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)

Prepared: 04/02/19 12:49 Analyzed: 04/02/19 12:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane	L3, V4, Z-01	<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

FINAL REPORT

Report ID: 05012019145117

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Blank (B9D0019-BLK1)

Prepared: 04/02/19 12:49 Analyzed: 04/02/19 12:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		96	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		101	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10		109	70-130		
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10		101	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		109	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10		105	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10		106	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		108	70-130		
1,2,3-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2,3-Trichloropropane		9.3	0.20	ug/L	10		93	70-130		
1,2,4-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2,4-Trimethylbenzene		9.7	1.0	ug/L	10		97	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.0	1.0	ug/L	10		90	70-130		
1,2-Dibromoethane (EDB)		9.5	0.50	ug/L	10		95	70-130		
1,2-Dichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10		105	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10		106	70-130		
1,3,5-Trimethylbenzene		9.8	1.0	ug/L	10		98	70-130		
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10		100	70-130		
1,4-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		114	70-130		
2-Chlorotoluene		9.7	1.0	ug/L	10		97	70-130		
4-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130		
Acetone		97	20	ug/L	100		97	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		101	70-130		
Benzene		10	0.50	ug/L	10		103	70-130		
Bromobenzene		9.5	1.0	ug/L	10		95	70-130		
Bromochloromethane		11	1.0	ug/L	10		106	70-130		
Bromodichloromethane		11	1.0	ug/L	10		107	70-130		
Bromoform		10	1.0	ug/L	10		100	70-130		
Bromomethane	L3, V4, Z-01	5.8	2.0	ug/L	10		58	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		114	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		9.7	0.50	ug/L	10		97	70-130		
Chloroethane		11	1.0	ug/L	10		106	70-130		
Chloroform		11	1.0	ug/L	10		107	70-130		
Chloromethane		8.4	1.0	ug/L	10		84	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130		
Dibromomethane		10	1.0	ug/L	10		104	70-130		
Dichlorodifluoromethane		8.3	1.0	ug/L	10		83	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		110	70-130		
Ethyl ether		10	1.0	ug/L	10		101	70-130		
Ethylbenzene		10	1.0	ug/L	10		100	70-130		
Hexachlorobutadiene		9.9	0.50	ug/L	10		99	70-130		
Isopropylbenzene		10	1.0	ug/L	10		100	70-130		
Methyl ethyl ketone (MEK)		49	10	ug/L	50		99	70-130		
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		104	70-130		
Methylene chloride		10	1.0	ug/L	10		105	70-130		
Naphthalene		9.2	1.0	ug/L	10		92	70-130		
n-Butylbenzene		10	1.0	ug/L	10		104	70-130		
n-Propylbenzene		10	1.0	ug/L	10		100	70-130		
o-Xylene		9.6	1.0	ug/L	10		96	70-130		
p&m-Xylene		10	1.0	ug/L	10		101	70-130		
p-Isopropyltoluene		9.9	1.0	ug/L	10		99	70-130		
sec-Butylbenzene		10	1.0	ug/L	10		100	70-130		
Styrene		9.3	1.0	ug/L	10		93	70-130		
tert-Butylbenzene		9.7	1.0	ug/L	10		97	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS (B9D0019-BS1)

Prepared: 04/02/19 10:30 Analyzed: 04/02/19 10:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		103	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100		101	70-130		
Toluene		9.9	1.0	ug/L	10		99	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130		
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10		109	70-130		
Vinyl chloride		9.8	0.050	ug/L	10		98	70-130		

LCS Dup (B9D0019-BSD1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		97	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		100	70-130	0.6	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	3	30
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10		95	70-130	1	30
1,1,2-Trichloroethane		10	0.50	ug/L	10		103	70-130	2	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		108	70-130	1	30
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130	1	30
1,1-Dichloroethene		10	1.0	ug/L	10		102	70-130	4	30
1,1-Dichloropropene		11	1.0	ug/L	10		107	70-130	1	30
1,2,3-Trichlorobenzene		9.7	1.0	ug/L	10		97	70-130	0.5	30
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130	2	30
1,2,4-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130	0.6	30
1,2,4-Trimethylbenzene		9.4	1.0	ug/L	10		94	70-130	2	30
1,2-Dibromo-3-chloropropane (DBCP)		9.3	1.0	ug/L	10		93	70-130	3	30
1,2-Dibromoethane (EDB)		9.6	0.50	ug/L	10		96	70-130	0.5	30
1,2-Dichlorobenzene		9.5	1.0	ug/L	10		95	70-130	0.5	30
1,2-Dichloroethane		11	0.20	ug/L	10		106	70-130	0.7	30
1,2-Dichloropropane		10	1.0	ug/L	10		105	70-130	1	30
1,3,5-Trimethylbenzene		9.5	1.0	ug/L	10		95	70-130	2	30
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	0.7	30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS Dup (B9D0019-BSD1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		10	1.0	ug/L	10		101	70-130	2	30
1,4-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	3	30
2,2-Dichloropropane		11	1.0	ug/L	10		108	70-130	5	30
2-Chlorotoluene		9.7	1.0	ug/L	10		97	70-130	0.1	30
4-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130	0.8	30
Acetone		94	20	ug/L	100		94	70-130	3	30
Allyl chloride		9.9	1.0	ug/L	10		99	70-130	3	30
Benzene		10	0.50	ug/L	10		102	70-130	2	30
Bromobenzene		9.6	1.0	ug/L	10		96	70-130	0.3	30
Bromochloromethane		10	1.0	ug/L	10		104	70-130	1	30
Bromodichloromethane		10	1.0	ug/L	10		104	70-130	3	30
Bromoform		9.8	1.0	ug/L	10		98	70-130	2	30
Bromomethane	L3, V4, Z-01	6.4	2.0	ug/L	10		64	70-130	10	30
Carbon tetrachloride		11	0.20	ug/L	10		112	70-130	2	30
Chlorobenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Chlorodibromomethane		9.8	0.50	ug/L	10		98	70-130	1	30
Chloroethane		10	1.0	ug/L	10		102	70-130	4	30
Chloroform		10	1.0	ug/L	10		104	70-130	3	30
Chloromethane		8.3	1.0	ug/L	10		83	70-130	0.7	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130	1	30
cis-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130	2	30
Dibromomethane		11	1.0	ug/L	10		106	70-130	2	30
Dichlorodifluoromethane		8.0	1.0	ug/L	10		80	70-130	3	30
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130	2	30
Ethyl ether		9.9	1.0	ug/L	10		99	70-130	2	30
Ethylbenzene		10	1.0	ug/L	10		100	70-130	0.2	30
Hexachlorobutadiene		9.9	0.50	ug/L	10		99	70-130	0.1	30
Isopropylbenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Methyl ethyl ketone (MEK)		48	10	ug/L	50		96	70-130	3	30
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50		100	70-130	0.1	30
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10		106	70-130	2	30
Methylene chloride		10	1.0	ug/L	10		104	70-130	1	30
Naphthalene		9.4	1.0	ug/L	10		94	70-130	2	30
n-Butylbenzene		10	1.0	ug/L	10		103	70-130	1	30
n-Propylbenzene		10	1.0	ug/L	10		100	70-130	0.1	30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

LCS Dup (B9D0019-BSD1)

Prepared: 04/02/19 10:58 Analyzed: 04/02/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		9.6	1.0	ug/L	10		96	70-130	0.1	30
p&m-Xylene		10	1.0	ug/L	10		101	70-130	0.3	30
p-Isopropyltoluene		9.8	1.0	ug/L	10		98	70-130	1	30
sec-Butylbenzene		9.9	1.0	ug/L	10		99	70-130	1	30
Styrene		9.5	1.0	ug/L	10		95	70-130	1	30
tert-Butylbenzene		9.6	1.0	ug/L	10		96	70-130	1	30
Tetrachloroethene		9.9	1.0	ug/L	10		99	70-130	4	30
Tetrahydrofuran (THF)		99	10	ug/L	100		99	70-130	2	30
Toluene		9.8	1.0	ug/L	10		98	70-130	2	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130	2	30
trans-1,3-Dichloropropene		10	0.50	ug/L	10		103	70-130	5	30
Trichloroethene (TCE)		9.8	0.10	ug/L	10		98	70-130	3	30
Trichlorofluoromethane		10	1.0	ug/L	10		105	70-130	4	30
Vinyl chloride		9.4	0.050	ug/L	10		94	70-130	3	30

Duplicate (B9D0019-DUP1)

Source: 19C1274-05

Prepared: 04/02/19 14:13 Analyzed: 04/02/19 14:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Duplicate (B9D0019-DUP1)		Source: 19C1274-05		Prepared: 04/02/19 14:13		Analyzed: 04/02/19 14:13		RPD	RPD Limit
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<			30
1,2-Dichlorobenzene		<	1.0	ug/L		<			30
1,2-Dichloroethane		<	0.20	ug/L		<			30
1,2-Dichloropropane		<	1.0	ug/L		<			30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<			30
1,3-Dichlorobenzene		<	1.0	ug/L		<			30
1,3-Dichloropropane		<	1.0	ug/L		<			30
1,4-Dichlorobenzene		<	1.0	ug/L		<			30
2,2-Dichloropropane		<	1.0	ug/L		<			30
2-Chlorotoluene		<	1.0	ug/L		<			30
4-Chlorotoluene		<	1.0	ug/L		<			30
Acetone		<	20	ug/L		<			30
Allyl chloride		<	1.0	ug/L		<			30
Benzene		<	0.50	ug/L		<			30
Bromobenzene		<	1.0	ug/L		<			30
Bromochloromethane		<	1.0	ug/L		<			30
Bromodichloromethane		<	1.0	ug/L		<			30
Bromoform		<	1.0	ug/L		<			30
Bromomethane	L3, V4, Z-01	<	2.0	ug/L		<			30
Carbon tetrachloride		<	0.20	ug/L		<			30
Chlorobenzene		<	1.0	ug/L		<			30
Chlorodibromomethane		<	0.50	ug/L		<			30
Chloroethane		<	1.0	ug/L		<			30
Chloroform		<	1.0	ug/L		<			30
Chloromethane		<	1.0	ug/L		<			30
cis-1,2-Dichloroethene		<	1.0	ug/L		<			30
cis-1,3-Dichloropropene		<	0.50	ug/L		<			30
Dibromomethane		<	1.0	ug/L		<			30
Dichlorodifluoromethane		<	1.0	ug/L		<			30
Dichlorofluoromethane		<	1.0	ug/L		<			30
Ethyl ether		3.1	1.0	ug/L		3.1			0 30
Ethylbenzene		<	1.0	ug/L		<			30
Hexachlorobutadiene		<	0.50	ug/L		<			30
Isopropylbenzene		<	1.0	ug/L		<			30
Methyl ethyl ketone (MEK)		<	10	ug/L		<			30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Duplicate (B9D0019-DUP1)		Source: 19C1274-05		Prepared: 04/02/19 14:13 Analyzed: 04/02/19 14:13						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		2.8	10	ug/L		<			1	30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		<	0.10	ug/L		<				30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		<	0.050	ug/L		<				30

Matrix Spike (B9D0019-MS1)		Source: 19C1274-04		Prepared: 04/02/19 11:26 Analyzed: 04/02/19 11:26						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		94	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		11	1.0	ug/L	10	<	105	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	115	70-130		
1,1,2,2-Tetrachloroethane		9.8	0.50	ug/L	10	<	98	70-130		
1,1,2-Trichloroethane		11	0.50	ug/L	10	<	106	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10	<	118	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	111	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	114	70-130		
1,1-Dichloropropene		12	1.0	ug/L	10	<	117	70-130		

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Matrix Spike (B9D0019-MS1)		Source: 19C1274-04		Prepared: 04/02/19 11:26		Analyzed: 04/02/19 11:26		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2,3-Trichloropropane		9.7	0.20	ug/L	10	<	97	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	101	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10	<	101	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.0	1.0	ug/L	10	<	90	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	104	70-130		
1,2-Dichlorobenzene		9.9	1.0	ug/L	10	<	99	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10	<	112	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10	<	113	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichloropropane		11	1.0	ug/L	10	<	105	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10	<	104	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	123	70-130		
2-Chlorotoluene		10	1.0	ug/L	10	<	101	70-130		
4-Chlorotoluene		10	1.0	ug/L	10	<	101	70-130		
Acetone		95	20	ug/L	100	<	95	70-130		
Allyl chloride		11	1.0	ug/L	10	<	110	70-130		
Benzene		11	0.50	ug/L	10	<	110	70-130		
Bromobenzene		9.8	1.0	ug/L	10	<	98	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	110	70-130		
Bromodichloromethane		11	1.0	ug/L	10	<	111	70-130		
Bromoform		10	1.0	ug/L	10	<	101	70-130		
Bromomethane	L3, V4, Z-01	7.3	2.0	ug/L	10	<	73	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	122	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	107	70-130		
Chlorodibromomethane		10	0.50	ug/L	10	<	101	70-130		
Chloroethane		11	1.0	ug/L	10	<	112	70-130		
Chloroform		11	1.0	ug/L	10	<	114	70-130		
Chloromethane		9.3	1.0	ug/L	10	<	93	70-130		
cis-1,2-Dichloroethene		11	1.0	ug/L	10	<	109	70-130		
cis-1,3-Dichloropropene		11	0.50	ug/L	10	<	106	70-130		
Dibromomethane		11	1.0	ug/L	10	<	112	70-130		
Dichlorodifluoromethane		9.0	1.0	ug/L	10	<	90	70-130		
Dichlorofluoromethane		12	1.0	ug/L	10	<	118	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0019 - EPA 5030B Preparation

Matrix Spike (B9D0019-MS1)		Source: 19C1274-04		Prepared: 04/02/19 11:26		Analyzed: 04/02/19 11:26		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ethyl ether		13	1.0	ug/L	10	3.3	102	70-130		
Ethylbenzene		11	1.0	ug/L	10	<	105	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10	<	104	70-130		
Isopropylbenzene		11	1.0	ug/L	10	<	108	70-130		
Methyl ethyl ketone (MEK)		49	10	ug/L	50	<	99	70-130		
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50	<	103	70-130		
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10	<	110	70-130		
Methylene chloride		11	1.0	ug/L	10	<	113	70-130		
Naphthalene		9.6	1.0	ug/L	10	<	96	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	111	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	106	70-130		
o-Xylene		10	1.0	ug/L	10	<	103	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	105	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10	<	104	70-130		
sec-Butylbenzene		11	1.0	ug/L	10	<	106	70-130		
Styrene		9.9	1.0	ug/L	10	<	99	70-130		
tert-Butylbenzene		10	1.0	ug/L	10	<	102	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	106	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100	<	98	70-130		
Toluene		10	1.0	ug/L	10	<	104	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	111	70-130		
trans-1,3-Dichloropropene		11	0.50	ug/L	10	<	107	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	108	70-130		
Trichlorofluoromethane		12	1.0	ug/L	10	<	116	70-130		
Vinyl chloride		11	0.050	ug/L	10	<	106	70-130		

Batch B9D0043 - EPA 5030B Preparation

Blank (B9D0043-BLK1)		Prepared: 04/03/19 15:45		Analyzed: 04/03/19 15:45		RPD	RPD Limit			
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		98	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

Blank (B9D0043-BLK1)

Prepared: 04/03/19 15:45 Analyzed: 04/03/19 15:45

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						
Bromomethane	V4, Z-01	<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

Blank (B9D0043-BLK1)

Prepared: 04/03/19 15:45 Analyzed: 04/03/19 15:45

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane	V4, Z-01	<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

LCS (B9D0043-BS1)

Prepared: 04/03/19 13:54 Analyzed: 04/03/19 13:54

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		96	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.6	1.0	ug/L	10		96	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		104	70-130		
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10		101	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		106	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		101	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		103	70-130		
1,1-Dichloropropene		10	1.0	ug/L	10		103	70-130		
1,2,3-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2,3-Trichloropropane		9.2	0.20	ug/L	10		92	70-130		
1,2,4-Trichlorobenzene		9.7	1.0	ug/L	10		97	70-130		
1,2,4-Trimethylbenzene		9.3	1.0	ug/L	10		93	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		8.9	1.0	ug/L	10		89	70-130		
1,2-Dibromoethane (EDB)		9.3	0.50	ug/L	10		93	70-130		
1,2-Dichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10		103	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10		104	70-130		
1,3,5-Trimethylbenzene		9.3	1.0	ug/L	10		93	70-130		
1,3-Dichlorobenzene		9.5	1.0	ug/L	10		95	70-130		
1,3-Dichloropropane		9.5	1.0	ug/L	10		95	70-130		
1,4-Dichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		108	70-130		
2-Chlorotoluene		9.2	1.0	ug/L	10		92	70-130		
4-Chlorotoluene		9.3	1.0	ug/L	10		93	70-130		
Acetone		98	20	ug/L	100		98	70-130		
Allyl chloride		10	1.0	ug/L	10		100	70-130		
Benzene		10	0.50	ug/L	10		100	70-130		
Bromobenzene		9.3	1.0	ug/L	10		93	70-130		
Bromochloromethane		11	1.0	ug/L	10		107	70-130		
Bromodichloromethane		10	1.0	ug/L	10		104	70-130		
Bromoform		9.9	1.0	ug/L	10		99	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

LCS (B9D0043-BS1)

Prepared: 04/03/19 13:54 Analyzed: 04/03/19 13:54

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane	Z-01, V4	7.4	2.0	ug/L	10		74	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		107	70-130		
Chlorobenzene		9.6	1.0	ug/L	10		96	70-130		
Chlorodibromomethane		9.4	0.50	ug/L	10		94	70-130		
Chloroethane		9.8	1.0	ug/L	10		98	70-130		
Chloroform		10	1.0	ug/L	10		104	70-130		
Chloromethane		8.1	1.0	ug/L	10		81	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130		
cis-1,3-Dichloropropene		9.5	0.50	ug/L	10		95	70-130		
Dibromomethane		10	1.0	ug/L	10		104	70-130		
Dichlorodifluoromethane	V4, Z-01	7.8	1.0	ug/L	10		78	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130		
Ethyl ether		10	1.0	ug/L	10		102	70-130		
Ethylbenzene		9.5	1.0	ug/L	10		95	70-130		
Hexachlorobutadiene		9.5	0.50	ug/L	10		95	70-130		
Isopropylbenzene		9.6	1.0	ug/L	10		96	70-130		
Methyl ethyl ketone (MEK)		50	10	ug/L	50		100	70-130		
Methyl isobutyl ketone (MIBK)		49	5.0	ug/L	50		98	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		104	70-130		
Methylene chloride		10	1.0	ug/L	10		101	70-130		
Naphthalene		9.3	1.0	ug/L	10		93	70-130		
n-Butylbenzene		10	1.0	ug/L	10		101	70-130		
n-Propylbenzene		9.7	1.0	ug/L	10		97	70-130		
o-Xylene		9.3	1.0	ug/L	10		93	70-130		
p&m-Xylene		9.4	1.0	ug/L	10		94	70-130		
p-Isopropyltoluene		9.4	1.0	ug/L	10		94	70-130		
sec-Butylbenzene		9.7	1.0	ug/L	10		97	70-130		
Styrene		9.0	1.0	ug/L	10		90	70-130		
tert-Butylbenzene		9.3	1.0	ug/L	10		93	70-130		
Tetrachloroethene		9.8	1.0	ug/L	10		98	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100		100	70-130		
Toluene		9.3	1.0	ug/L	10		93	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130		
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130		
Trichloroethene (TCE)		9.7	0.10	ug/L	10		97	70-130		

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Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

LCS (B9D0043-BS1)

Prepared: 04/03/19 13:54 Analyzed: 04/03/19 13:54

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		11	1.0	ug/L	10		105	70-130		
Vinyl chloride		9.2	0.050	ug/L	10		92	70-130		

LCS Dup (B9D0043-BS1)

Prepared: 04/03/19 14:22 Analyzed: 04/03/19 14:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		97	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		101	70-130	4	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		110	70-130	7	30
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10		95	70-130	1	30
1,1,2-Trichloroethane		9.9	0.50	ug/L	10		99	70-130	2	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		110	70-130	4	30
1,1-Dichloroethane		11	1.0	ug/L	10		106	70-130	4	30
1,1-Dichloroethene		10	1.0	ug/L	10		105	70-130	1	30
1,1-Dichloropropene		11	1.0	ug/L	10		108	70-130	4	30
1,2,3-Trichlorobenzene		9.9	1.0	ug/L	10		99	70-130	3	30
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130	3	30
1,2,4-Trichlorobenzene		9.9	1.0	ug/L	10		99	70-130	1	30
1,2,4-Trimethylbenzene		9.7	1.0	ug/L	10		97	70-130	4	30
1,2-Dibromo-3-chloropropane (DBCP)		9.4	1.0	ug/L	10		94	70-130	6	30
1,2-Dibromoethane (EDB)		9.7	0.50	ug/L	10		97	70-130	4	30
1,2-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	2	30
1,2-Dichloroethane		11	0.20	ug/L	10		106	70-130	3	30
1,2-Dichloropropane		10	1.0	ug/L	10		105	70-130	1	30
1,3,5-Trimethylbenzene		9.6	1.0	ug/L	10		96	70-130	3	30
1,3-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	0.4	30
1,3-Dichloropropane		9.9	1.0	ug/L	10		99	70-130	4	30
1,4-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130	3	30
2,2-Dichloropropane		11	1.0	ug/L	10		112	70-130	4	30
2-Chlorotoluene		9.8	1.0	ug/L	10		98	70-130	6	30
4-Chlorotoluene		9.7	1.0	ug/L	10		97	70-130	5	30
Acetone		100	20	ug/L	100		102	70-130	4	30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

LCS Dup (B9D0043-BSD1)

Prepared: 04/03/19 14:22 Analyzed: 04/03/19 14:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		105	70-130	4	30
Benzene		10	0.50	ug/L	10		104	70-130	3	30
Bromobenzene		9.5	1.0	ug/L	10		95	70-130	2	30
Bromochloromethane		11	1.0	ug/L	10		106	70-130	1	30
Bromodichloromethane		11	1.0	ug/L	10		108	70-130	4	30
Bromoform		10	1.0	ug/L	10		100	70-130	1	30
Bromomethane	V4, Z-01	8.1	2.0	ug/L	10		81	70-130	9	30
Carbon tetrachloride		11	0.20	ug/L	10		113	70-130	5	30
Chlorobenzene		10	1.0	ug/L	10		100	70-130	4	30
Chlorodibromomethane		9.8	0.50	ug/L	10		98	70-130	4	30
Chloroethane		10	1.0	ug/L	10		104	70-130	6	30
Chloroform		11	1.0	ug/L	10		106	70-130	3	30
Chloromethane		8.3	1.0	ug/L	10		83	70-130	2	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130	3	30
cis-1,3-Dichloropropene		9.7	0.50	ug/L	10		97	70-130	2	30
Dibromomethane		10	1.0	ug/L	10		104	70-130	0.4	30
Dichlorodifluoromethane	V4, Z-01	8.3	1.0	ug/L	10		83	70-130	6	30
Dichlorofluoromethane		11	1.0	ug/L	10		110	70-130	4	30
Ethyl ether		10	1.0	ug/L	10		101	70-130	1	30
Ethylbenzene		10	1.0	ug/L	10		101	70-130	6	30
Hexachlorobutadiene		10	0.50	ug/L	10		101	70-130	6	30
Isopropylbenzene		10	1.0	ug/L	10		101	70-130	5	30
Methyl ethyl ketone (MEK)		51	10	ug/L	50		103	70-130	3	30
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50		102	70-130	4	30
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		105	70-130	0.4	30
Methylene chloride		10	1.0	ug/L	10		104	70-130	3	30
Naphthalene		9.6	1.0	ug/L	10		96	70-130	3	30
n-Butylbenzene		10	1.0	ug/L	10		105	70-130	4	30
n-Propylbenzene		10	1.0	ug/L	10		101	70-130	4	30
o-Xylene		9.7	1.0	ug/L	10		97	70-130	4	30
p&m-Xylene		10	1.0	ug/L	10		101	70-130	7	30
p-Isopropyltoluene		10	1.0	ug/L	10		100	70-130	5	30
sec-Butylbenzene		10	1.0	ug/L	10		102	70-130	5	30
Styrene		9.3	1.0	ug/L	10		93	70-130	3	30
tert-Butylbenzene		10	1.0	ug/L	10		100	70-130	7	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

LCS Dup (B9D0043-BSD1)

Prepared: 04/03/19 14:22 Analyzed: 04/03/19 14:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		101	70-130	3	30
Tetrahydrofuran (THF)		100	10	ug/L	100		104	70-130	4	30
Toluene		9.8	1.0	ug/L	10		98	70-130	6	30
trans-1,2-Dichloroethene		11	1.0	ug/L	10		107	70-130	5	30
trans-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130	0.1	30
Trichloroethene (TCE)		10	0.10	ug/L	10		102	70-130	5	30
Trichlorofluoromethane		11	1.0	ug/L	10		110	70-130	4	30
Vinyl chloride		9.7	0.050	ug/L	10		97	70-130	6	30

Duplicate (B9D0043-DUP1)

Source: 19D0067-07RE2

Prepared: 04/03/19 17:09 Analyzed: 04/03/19 17:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4	F5	99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene	F5	98	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3	F5	101	70-130	%	10					
1,1,1,2-Tetrachloroethane	D2, F5	<	100	ug/L		<				30
1,1,1-Trichloroethane	D2, F5	<	100	ug/L		<				30
1,1,2,2-Tetrachloroethane	D2, F5	<	50	ug/L		<				30
1,1,2-Trichloroethane	D2, F5	<	50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane	D2, F5	<	100	ug/L		<				30
1,1-Dichloroethane	D2, F5	<	100	ug/L		<				30
1,1-Dichloroethene	D2, F5	<	100	ug/L		<				30
1,1-Dichloropropene	D2, F5	<	100	ug/L		<				30
1,2,3-Trichlorobenzene	F5, D2	<	100	ug/L		<				30
1,2,3-Trichloropropane	D2, F5	<	20	ug/L		<				30
1,2,4-Trichlorobenzene	D2, F5	<	100	ug/L		<				30
1,2,4-Trimethylbenzene	D2, F5	53	100	ug/L		<			12	30
1,2-Dibromo-3-chloropropane (DBCP)	D2, F5	<	100	ug/L		<				30
1,2-Dibromoethane (EDB)	D2, F5	<	50	ug/L		<				30
1,2-Dichlorobenzene	D2, F5	<	100	ug/L		<				30
1,2-Dichloroethane	D2, F5	<	20	ug/L		<				30
1,2-Dichloropropane	D2, F5	<	100	ug/L		<				30
1,3,5-Trimethylbenzene	D2, F5	<	100	ug/L		<				30
1,3-Dichlorobenzene	D2, F5	<	100	ug/L		<				30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

Duplicate (B9D0043-DUP1)

Source: 19D0067-07RE2

Prepared: 04/03/19 17:09 Analyzed: 04/03/19 17:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane	D2, F5	<	100	ug/L		<				30
1,4-Dichlorobenzene	D2, F5	<	100	ug/L		<				30
2,2-Dichloropropane	D2, F5	<	100	ug/L		<				30
2-Chlorotoluene	D2, F5	<	100	ug/L		<				30
4-Chlorotoluene	D2, F5	<	100	ug/L		<				30
Acetone	D2, F5	8900	2000	ug/L		8600			3	30
Allyl chloride	D2, F5	<	100	ug/L		<				30
Benzene	D2, F5	17	50	ug/L		<				30
Bromobenzene	D2, F5	<	100	ug/L		<				30
Bromochloromethane	D2, F5	<	100	ug/L		<				30
Bromodichloromethane	D2, F5	<	100	ug/L		<				30
Bromoform	D2, F5	<	100	ug/L		<				30
Bromomethane	D2, F5, V4, Z-01	<	200	ug/L		<				30
Carbon tetrachloride	D2, F5	<	20	ug/L		<				30
Chlorobenzene	D2, F5	<	100	ug/L		<				30
Chlorodibromomethane	D2, F5	<	50	ug/L		<				30
Chloroethane	D2, F5	<	100	ug/L		<				30
Chloroform	D2, F5	<	100	ug/L		<				30
Chloromethane	D2, F5	36	100	ug/L		<			18	30
cis-1,2-Dichloroethene	D2, F5	450	100	ug/L		440			0.9	30
cis-1,3-Dichloropropene	D2, F5	<	50	ug/L		<				30
Dibromomethane	D2, F5	<	100	ug/L		<				30
Dichlorodifluoromethane	D2, F5, V4, Z-01	<	100	ug/L		<				30
Dichlorofluoromethane	D2, F5	<	100	ug/L		<				30
Ethyl ether	D2, F5	51	100	ug/L		<			0	30
Ethylbenzene	D2, F5	110	100	ug/L		100			7	30
Hexachlorobutadiene	D2, F5	<	50	ug/L		<				30
Isopropylbenzene	D2, F5	<	100	ug/L		<				30
Methyl ethyl ketone (MEK)	D2, F5	14000	1000	ug/L		14000			0.5	30
Methyl isobutyl ketone (MIBK)	D2, F5	1500	500	ug/L		1400			4	30
Methyl tertiary butyl ether (MTBE)	D2, F5	<	200	ug/L		<				30
Methylene chloride	D2, F5	45	100	ug/L		<			7	30
Naphthalene	D2, F5	<	100	ug/L		<				30
n-Butylbenzene	D2, F5	<	100	ug/L		<				30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

Duplicate (B9D0043-DUP1) Source: 19D0067-07RE2 Prepared: 04/03/19 17:09 Analyzed: 04/03/19 17:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
n-Propylbenzene	D2, F5	<	100	ug/L		<				30
o-Xylene	D2, F5	98	100	ug/L		<			6	30
p&m-Xylene	D2, F5	260	100	ug/L		240			6	30
p-Isopropyltoluene	D2, F5	<	100	ug/L		<				30
sec-Butylbenzene	D2, F5	<	100	ug/L		<				30
Styrene	D2, F5	28	100	ug/L		<			4	30
tert-Butylbenzene	F5, D2	<	100	ug/L		<				30
Tetrachloroethene	D2, F5	93	100	ug/L		<			8	30
Tetrahydrofuran (THF)	D2, F5	890	1000	ug/L		<			1	30
Toluene	D2, F5	640	100	ug/L		610			4	30
trans-1,2-Dichloroethene	D2, F5	<	100	ug/L		<				30
trans-1,3-Dichloropropene	D2, F5	<	50	ug/L		<				30
Trichloroethene (TCE)	D2, F5	140	10	ug/L		140			4	30
Trichlorofluoromethane	D2, F5	<	100	ug/L		<				30
Vinyl chloride	D2, F5	32	5.0	ug/L		30			6	30

Matrix Spike (B9D0043-MS1) Source: 19D0067-07RE3 Prepared: 04/03/19 14:50 Analyzed: 04/03/19 14:50

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4	F5	102	70-130	%	10					
Surrogate: 4-Bromofluorobenzene	F5	96	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3	F5	100	70-130	%	10					
1,1,1,2-Tetrachloroethane	D2, F5	11000	1000	ug/L	10,000	<	109	70-130		
1,1,1-Trichloroethane	D2, F5	11000	1000	ug/L	10,000	<	112	70-130		
1,1,2,2-Tetrachloroethane	D2, F5	9700	500	ug/L	10,000	<	97	70-130		
1,1,2-Trichloroethane	D2, F5	11000	500	ug/L	10,000	<	105	70-130		
1,1,2-Trichlorotrifluoroethane	D2, F5	12000	1000	ug/L	10,000	<	118	70-130		
1,1-Dichloroethane	D2, F5	11000	1000	ug/L	10,000	<	109	70-130		
1,1-Dichloroethene	D2, F5	11000	1000	ug/L	10,000	<	111	70-130		
1,1-Dichloropropene	D2, F5	11000	1000	ug/L	10,000	<	113	70-130		
1,2,3-Trichlorobenzene	D2, F5	10000	1000	ug/L	10,000	<	103	70-130		
1,2,3-Trichloropropane	D2, F5	9800	200	ug/L	10,000	<	98	70-130		
1,2,4-Trichlorobenzene	D2, F5	10000	1000	ug/L	10,000	<	102	70-130		
1,2,4-Trimethylbenzene	D2, F5	10000	1000	ug/L	10,000	<	103	70-130		

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

Matrix Spike (B9D0043-MS1)

Source: 19D0067-07RE3

Prepared: 04/03/19 14:50 Analyzed: 04/03/19 14:50

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromo-3-chloropropane (DBCP)	D2, F5	9200	1000	ug/L	10,000	<	92	70-130		
1,2-Dibromoethane (EDB)	F5, D2	10000	500	ug/L	10,000	<	104	70-130		
1,2-Dichlorobenzene	D2, F5	10000	1000	ug/L	10,000	<	100	70-130		
1,2-Dichloroethane	D2, F5	11000	200	ug/L	10,000	<	108	70-130		
1,2-Dichloropropane	D2, F5	11000	1000	ug/L	10,000	<	110	70-130		
1,3,5-Trimethylbenzene	D2, F5	10000	1000	ug/L	10,000	<	102	70-130		
1,3-Dichlorobenzene	D2, F5	10000	1000	ug/L	10,000	<	102	70-130		
1,3-Dichloropropane	D2, F5	11000	1000	ug/L	10,000	<	106	70-130		
1,4-Dichlorobenzene	D2, F5	10000	1000	ug/L	10,000	<	101	70-130		
2,2-Dichloropropane	D2, F5	12000	1000	ug/L	10,000	<	119	70-130		
2-Chlorotoluene	D2, F5	10000	1000	ug/L	10,000	<	101	70-130		
4-Chlorotoluene	D2, F5	10000	1000	ug/L	10,000	<	100	70-130		
Acetone	D2, F5	110000	20000	ug/L	100,000	<	99	70-130		
Allyl chloride	D2, F5	11000	1000	ug/L	10,000	<	108	70-130		
Benzene	D2, F5	11000	500	ug/L	10,000	<	108	70-130		
Bromobenzene	D2, F5	10000	1000	ug/L	10,000	<	100	70-130		
Bromochloromethane	D2, F5	11000	1000	ug/L	10,000	<	111	70-130		
Bromodichloromethane	D2, F5	11000	1000	ug/L	10,000	<	109	70-130		
Bromoform	D2, F5	10000	1000	ug/L	10,000	<	105	70-130		
Bromomethane	Z-01, D2, F5, V4	8800	2000	ug/L	10,000	<	88	70-130		
Carbon tetrachloride	D2, F5	12000	200	ug/L	10,000	<	117	70-130		
Chlorobenzene	D2, F5	11000	1000	ug/L	10,000	<	107	70-130		
Chlorodibromomethane	D2, F5	10000	500	ug/L	10,000	<	103	70-130		
Chloroethane	D2, F5	11000	1000	ug/L	10,000	<	110	70-130		
Chloroform	D2, F5	11000	1000	ug/L	10,000	<	110	70-130		
Chloromethane	D2, F5	8900	1000	ug/L	10,000	<	86	70-130		
cis-1,2-Dichloroethene	D2, F5	11000	1000	ug/L	10,000	<	106	70-130		
cis-1,3-Dichloropropene	F5, D2	10000	500	ug/L	10,000	<	105	70-130		
Dibromomethane	D2, F5	11000	1000	ug/L	10,000	<	111	70-130		
Dichlorodifluoromethane	D2, F5, V4, Z-01	8700	1000	ug/L	10,000	<	87	70-130		
Dichlorofluoromethane	D2, F5	11000	1000	ug/L	10,000	<	115	70-130		
Ethyl ether	D2, F5	10000	1000	ug/L	10,000	<	105	70-130		
Ethylbenzene	D2, F5	11000	1000	ug/L	10,000	<	108	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0043 - EPA 5030B Preparation

Matrix Spike (B9D0043-MS1)		Source: 19D0067-07RE3		Prepared: 04/03/19 14:50		Analyzed: 04/03/19 14:50		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Hexachlorobutadiene	D2, F5	11000	500	ug/L	10,000	<	105	70-130		
Isopropylbenzene	D2, F5	11000	1000	ug/L	10,000	<	108	70-130		
Methyl ethyl ketone (MEK)	D2, F5	64000	10000	ug/L	50,000	13000	102	70-130		
Methyl isobutyl ketone (MIBK)	F5, D2	54000	5000	ug/L	50,000	<	106	70-130		
Methyl tertiary butyl ether (MTBE)	D2, F5	11000	2000	ug/L	10,000	<	110	70-130		
Methylene chloride	D2, F5	11000	1000	ug/L	10,000	<	110	70-130		
Naphthalene	D2, F5	9800	1000	ug/L	10,000	<	98	70-130		
n-Butylbenzene	D2, F5	11000	1000	ug/L	10,000	<	110	70-130		
n-Propylbenzene	D2, F5	11000	1000	ug/L	10,000	<	105	70-130		
o-Xylene	D2, F5	10000	1000	ug/L	10,000	<	104	70-130		
p&m-Xylene	D2, F5	11000	1000	ug/L	10,000	<	109	70-130		
p-Isopropyltoluene	D2, F5	10000	1000	ug/L	10,000	<	104	70-130		
sec-Butylbenzene	D2, F5	11000	1000	ug/L	10,000	<	106	70-130		
Styrene	D2, F5	10000	1000	ug/L	10,000	<	100	70-130		
tert-Butylbenzene	D2, F5	10000	1000	ug/L	10,000	<	104	70-130		
Tetrachloroethene	D2, F5	11000	1000	ug/L	10,000	<	109	70-130		
Tetrahydrofuran (THF)	D2, F5	100000	10000	ug/L	100,000	<	100	70-130		
Toluene	D2, F5	11000	1000	ug/L	10,000	<	104	70-130		
trans-1,2-Dichloroethene	D2, F5	11000	1000	ug/L	10,000	<	108	70-130		
trans-1,3-Dichloropropene	D2, F5	11000	500	ug/L	10,000	<	108	70-130		
Trichloroethene (TCE)	D2, F5	11000	100	ug/L	10,000	150	106	70-130		
Trichlorofluoromethane	D2, F5	12000	1000	ug/L	10,000	<	116	70-130		
Vinyl chloride	D2, F5	11000	50	ug/L	10,000	<	105	70-130		

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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

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Batch B9D0396 - 1,4 Dioxane in Water SPE

Blank (B9D0396-BLK1) Prepared: 04/23/19 08:00 Analyzed: 04/24/19 10:18

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.049	ug/L						

LCS (B9D0396-BS1) Prepared: 04/23/19 08:00 Analyzed: 04/24/19 10:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.20	0.049	ug/L	0.19		103	80-120		

Duplicate (B9D0396-DUP1) Source: 19C1238-20 Prepared: 04/23/19 08:00 Analyzed: 04/24/19 12:10

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.073	0.049	ug/L		0.067			10	30

Matrix Spike (B9D0396-MS1) Source: 19C1238-21 Prepared: 04/23/19 08:00 Analyzed: 04/24/19 12:42

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		1.4	0.050	ug/L	0.44	0.91	110	70-130		

Batch B9D0423 - 1,4 Dioxane in Water SPE

Blank (B9D0423-BLK1) Prepared: 04/24/19 08:00 Analyzed: 04/26/19 11:55

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.051	ug/L						

LCS (B9D0423-BS1) Prepared: 04/24/19 08:00 Analyzed: 04/26/19 12:11

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.21	0.051	ug/L	0.20		100	80-120		

Duplicate (B9D0423-DUP1) Source: 19D0434-02 Prepared: 04/24/19 08:00 Analyzed: 04/26/19 14:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.23	0.052	ug/L		0.20			15	30

Matrix Spike (B9D0423-MS1) Source: 19D0434-03 Prepared: 04/24/19 08:00 Analyzed: 04/26/19 15:38

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

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Batch B9D0423 - 1,4 Dioxane in Water SPE

Matrix Spike (B9D0423-MS1)

Source: 19D0434-03

Prepared: 04/24/19 08:00 Analyzed: 04/26/19 15:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.48	0.051	ug/L	0.45	<	105	70-130		

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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

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Batch B9D0230 - PFCs Preparation

Blank (B9D0230-BLK1)

Prepared: 04/12/19 12:59 Analyzed: 04/12/19 12:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0230-BLK2)

Prepared: 04/12/19 18:46 Analyzed: 04/12/19 18:46

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0230-BS1)

Prepared: 04/12/19 12:51 Analyzed: 04/12/19 12:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		101	80-120		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		103	80-120		
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50		109	80-120		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		107	80-120		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49		104	80-120		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5		105	80-120		
Perfluoropentanoic acid (PFPeA)		0.49	0.050	ug/L	0.5		98	80-120		

LCS Dup (B9D0230-BSD1)

Prepared: 04/12/19 18:38 Analyzed: 04/12/19 18:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50		107	80-120	6	20
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5		106	80-120	3	20
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50		103	80-120	6	20

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Final Report
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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

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Batch B9D0230 - PFCs Preparation

LCS Dup (B9D0230-BSD1)

Prepared: 04/12/19 18:38 Analyzed: 04/12/19 18:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5		100	80-120	6	20
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49		105	80-120	0.8	20
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5		111	80-120	6	20
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		105	80-120	6	20

Duplicate (B9D0230-DUP1)

Source: 19D0067-02

Prepared: 04/12/19 13:24 Analyzed: 04/12/19 13:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)	J, WB	0.019	0.050	ug/L		<			23	20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L		<				20
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L		<				20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B9D0230-MS1)

Source: 19D0067-02

Prepared: 04/12/19 13:16 Analyzed: 04/12/19 13:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	99	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	107	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	101	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0230-MS2)

Source: 19D0067-03

Prepared: 04/12/19 13:48 Analyzed: 04/12/19 13:48

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.55	0.050	ug/L	0.5	<	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	99	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	99	70-130		
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5	<	109	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

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Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MS2) Source: 19D0067-03 Prepared: 04/12/19 13:48 Analyzed: 04/12/19 13:48

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0230-MS3) Source: 19D0067-04 Prepared: 04/12/19 14:04 Analyzed: 04/12/19 14:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.57	0.050	ug/L	0.5	0.056	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.56	0.025	ug/L	0.50	<	112	70-130		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5	<	94	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	100	70-130		
Perfluorooctanoic acid (PFOA)		0.57	0.035	ug/L	0.5	0.068	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0230-MS4) Source: 19D0067-05 Prepared: 04/12/19 14:20 Analyzed: 04/12/19 14:20

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.57	0.050	ug/L	0.50	0.066	101	70-130		
Perfluorobutanoic acid (PFBA)		1.3	0.050	ug/L	0.5	0.78	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.60	0.025	ug/L	0.50	0.087	103	70-130		
Perfluorohexanoic acid (PFHxA)		0.84	0.050	ug/L	0.5	0.30	108	70-130		
Perfluorooctanesulfonate (PFOS)		0.59	0.025	ug/L	0.49	0.063	105	70-130		
Perfluorooctanoic acid (PFOA)		0.75	0.035	ug/L	0.5	0.20	110	70-130		
Perfluoropentanoic acid (PFPeA)		0.73	0.050	ug/L	0.5	0.24	97	70-130		

Matrix Spike (B9D0230-MS6) Source: 19D0067-07 Prepared: 04/12/19 14:52 Analyzed: 04/12/19 14:52

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)	D1	2.8	0.25	ug/L	2.50	<	110	70-130		
Perfluorobutanoic acid (PFBA)	D1	6.4	0.25	ug/L	2.5	4.0	96	70-130		
Perfluorohexanesulfonate (PFHxS)	D1	2.9	0.12	ug/L	2.50	0.26	105	70-130		
Perfluorohexanoic acid (PFHxA)	D1	3.3	0.25	ug/L	2.5	0.80	98	70-130		
Perfluorooctanesulfonate (PFOS)	D1	3.0	0.12	ug/L	2.49	0.48	101	70-130		
Perfluorooctanoic acid (PFOA)	D1	3.1	0.18	ug/L	2.5	0.53	101	70-130		
Perfluoropentanoic acid (PFPeA)	D1	3.0	0.25	ug/L	2.5	0.59	98	70-130		

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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

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Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MS7) Source: 19D0067-08 Prepared: 04/12/19 15:09 Analyzed: 04/12/19 15:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	99	70-130		
Perfluorobutanoic acid (PFBA)		0.59	0.050	ug/L	0.5	0.088	100	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	0.029	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.56	0.050	ug/L	0.5	0.051	102	70-130		
Perfluorooctanesulfonate (PFOS)		0.57	0.025	ug/L	0.49	0.046	105	70-130		
Perfluorooctanoic acid (PFOA)		0.62	0.035	ug/L	0.5	0.061	112	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	100	70-130		

Matrix Spike (B9D0230-MS8) Source: 19D0244-02 Prepared: 04/12/19 15:25 Analyzed: 04/12/19 15:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.59	0.050	ug/L	0.5	0.078	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.63	0.025	ug/L	0.50	0.12	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.59	0.050	ug/L	0.5	0.085	101	70-130		
Perfluorooctanesulfonate (PFOS)		0.67	0.025	ug/L	0.49	0.12	111	70-130		
Perfluorooctanoic acid (PFOA)		1.4	0.035	ug/L	0.5	0.93	84	70-130		
Perfluoropentanoic acid (PFPeA)		0.57	0.050	ug/L	0.5	<	106	70-130		

Matrix Spike (B9D0230-MS9) Source: 19D0244-03 Prepared: 04/12/19 15:41 Analyzed: 04/12/19 15:41

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.58	0.050	ug/L	0.50	0.060	103	70-130		
Perfluorobutanoic acid (PFBA)		1.4	0.050	ug/L	0.5	0.92	92	70-130		
Perfluorohexanesulfonate (PFHxS)		0.72	0.025	ug/L	0.50	0.15	113	70-130		
Perfluorohexanoic acid (PFHxA)		1.7	0.050	ug/L	0.5	1.2	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.92	0.025	ug/L	0.49	0.43	98	70-130		
Perfluoropentanoic acid (PFPeA)		1.1	0.050	ug/L	0.5	0.62	91	70-130		

Matrix Spike (B9D0230-MSA) Source: 19D0244-04 Prepared: 04/12/19 15:57 Analyzed: 04/12/19 15:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.63	0.050	ug/L	0.5	0.10	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.74	0.025	ug/L	0.50	0.21	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.66	0.050	ug/L	0.5	0.15	102	70-130		

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MSA) Source: 19D0244-04 Prepared: 04/12/19 15:57 Analyzed: 04/12/19 15:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanesulfonate (PFOS)		2.2	0.025	ug/L	0.49	1.6	111	70-130		
Perfluorooctanoic acid (PFOA)		2.6	0.035	ug/L	0.5	2.1	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.57	0.050	ug/L	0.5	0.070	100	70-130		

Matrix Spike (B9D0230-MSB) Source: 19D0244-05 Prepared: 04/12/19 16:13 Analyzed: 04/12/19 16:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5	<	100	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	107	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0230-MSC) Source: 19D0244-06 Prepared: 04/12/19 16:29 Analyzed: 04/12/19 16:29

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.59	0.050	ug/L	0.50	0.065	106	70-130		
Perfluorobutanoic acid (PFBA)		0.59	0.050	ug/L	0.5	0.056	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.65	0.025	ug/L	0.50	0.12	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.68	0.050	ug/L	0.5	0.21	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.79	0.025	ug/L	0.49	0.28	103	70-130		
Perfluorooctanoic acid (PFOA)		1.4	0.035	ug/L	0.5	0.95	89	70-130		
Perfluoropentanoic acid (PFPeA)		0.59	0.050	ug/L	0.5	0.076	103	70-130		

Matrix Spike (B9D0230-MSD) Source: 19D0293-01 Prepared: 04/12/19 16:45 Analyzed: 04/12/19 16:45

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.69	0.050	ug/L	0.5	0.20	99	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.56	0.025	ug/L	0.49	0.043	103	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	96	70-130		
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5	<	100	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike Dup (B9D0230-MSD1)

Source: 19D0067-02

Prepared: 04/12/19 13:32 Analyzed: 04/12/19 13:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50	<	109	70-130	4	20
Perfluorobutanoic acid (PFBA)		0.55	0.050	ug/L	0.5	<	105	70-130	5	20
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	101	70-130	6	20
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	97	70-130	7	20
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	100	70-130	0.7	20
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	105	70-130	7	20
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5	<	100	70-130	5	20

Matrix Spike (B9D0230-MSE)

Source: 19D0293-02

Prepared: 04/12/19 17:01 Analyzed: 04/12/19 17:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	101	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	105	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	105	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	106	70-130		

Matrix Spike (B9D0230-MSF)

Source: 19D0293-03

Prepared: 04/12/19 17:17 Analyzed: 04/12/19 17:17

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	99	70-130		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	96	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	107	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0230-MSG)

Source: 19D0293-04

Prepared: 04/12/19 17:34 Analyzed: 04/12/19 17:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.72	0.050	ug/L	0.5	0.20	104	70-130		

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MSG) Source: 19D0293-04 Prepared: 04/12/19 17:34 Analyzed: 04/12/19 17:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	99	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5	<	109	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0230-MSH) Source: 19D0293-05 Prepared: 04/12/19 17:50 Analyzed: 04/12/19 17:50

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.56	0.050	ug/L	0.50	<	111	70-130		
Perfluorobutanoic acid (PFBA)		0.69	0.050	ug/L	0.5	0.20	98	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	105	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	105	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0230-MSI) Source: 19D0293-06 Prepared: 04/12/19 18:06 Analyzed: 04/12/19 18:06

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.74	0.050	ug/L	0.5	0.24	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	107	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.56	0.025	ug/L	0.49	0.032	107	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	102	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0230-MSJ) Source: 19D0293-07 Prepared: 04/12/19 18:22 Analyzed: 04/12/19 18:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5	<	97	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MSJ)		Source: 19D0293-07		Prepared: 04/12/19 18:22 Analyzed: 04/12/19 18:22						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	108	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	107	70-130		

Batch B9D0274 - PFCs Preparation

Blank (B9D0274-BLK1)		Prepared: 04/15/19 16:09 Analyzed: 04/15/19 16:09								
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0274-BLK2)		Prepared: 04/15/19 21:40 Analyzed: 04/15/19 21:40								
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0274-BS1)		Prepared: 04/15/19 16:01 Analyzed: 04/15/19 16:01								
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50		102	80-120		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5		105	80-120		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50		102	80-120		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		106	80-120		
Perfluorooctanesulfonate (PFOS)		0.54	0.025	ug/L	0.49		108	80-120		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5		104	80-120		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

LCS (B9D0274-BS1)

Prepared: 04/15/19 16:01 Analyzed: 04/15/19 16:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		105	80-120		

LCS Dup (B9D0274-BSD1)

Prepared: 04/15/19 21:32 Analyzed: 04/15/19 21:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		100	80-120	2	20
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5		108	80-120	3	20
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50		110	80-120	7	20
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		106	80-120	0.6	20
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49		104	80-120	3	20
Perfluorooctanoic acid (PFOA)		0.48	0.035	ug/L	0.5		97	80-120	7	20
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5		108	80-120	3	20

Duplicate (B9D0274-DUP1)

Source: 19D0380-01

Prepared: 04/15/19 17:06 Analyzed: 04/15/19 17:06

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)		0.19	0.050	ug/L		0.17			10	20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L		<				20
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L		<				20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B9D0274-MS1)

Source: 19D0380-01

Prepared: 04/15/19 16:58 Analyzed: 04/15/19 16:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.70	0.050	ug/L	0.5	0.17	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	106	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	106	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MS3) Source: 19D0244-03RE1 Prepared: 04/15/19 16:42 Analyzed: 04/15/19 16:42

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	D1	16	0.18	ug/L	2.5	13	110	70-130		

Matrix Spike (B9D0274-MS4) Source: 19D0380-02 Prepared: 04/15/19 17:30 Analyzed: 04/15/19 17:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	102	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	104	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	107	70-130		

Matrix Spike (B9D0274-MS5) Source: 19D0389-01 Prepared: 04/15/19 17:47 Analyzed: 04/15/19 17:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.55	0.050	ug/L	0.5	<	109	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	103	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	108	70-130		

Matrix Spike (B9D0274-MS6) Source: 19D0389-02 Prepared: 04/15/19 18:03 Analyzed: 04/15/19 18:03

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.75	0.050	ug/L	0.5	0.21	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.57	0.050	ug/L	0.5	<	115	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	<	111	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	106	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	109	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MS7) Source: 19D0389-03 Prepared: 04/15/19 18:19 Analyzed: 04/15/19 18:19

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.75	0.050	ug/L	0.5	0.20	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	103	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0274-MS8) Source: 19D0434-02 Prepared: 04/15/19 18:35 Analyzed: 04/15/19 18:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	109	70-130		
Perfluorobutanoic acid (PFBA)		0.57	0.050	ug/L	0.5	<	111	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5	<	95	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0274-MS9) Source: 19D0434-09 Prepared: 04/15/19 18:51 Analyzed: 04/15/19 18:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		1.3	0.050	ug/L	0.5	0.80	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50	0.031	104	70-130		
Perfluorohexanoic acid (PFHxA)		0.76	0.050	ug/L	0.5	0.26	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.58	0.035	ug/L	0.5	0.075	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.76	0.050	ug/L	0.5	0.26	100	70-130		

Matrix Spike (B9D0274-MSA) Source: 19D0435-07 Prepared: 04/15/19 19:07 Analyzed: 04/15/19 19:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	99	70-130		
Perfluorobutanoic acid (PFBA)		0.56	0.050	ug/L	0.5	<	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MSA) Source: 19D0435-07 Prepared: 04/15/19 19:07 Analyzed: 04/15/19 19:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	108	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	107	70-130		

Matrix Spike (B9D0274-MSB) Source: 19D0435-09 Prepared: 04/15/19 19:23 Analyzed: 04/15/19 19:23

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.63	0.050	ug/L	0.5	0.084	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.57	0.025	ug/L	0.50	<	113	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0274-MSC) Source: 19D0435-10 Prepared: 04/15/19 19:39 Analyzed: 04/15/19 19:39

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.58	0.050	ug/L	0.50	<	110	70-130		
Perfluorobutanoic acid (PFBA)		1.5	0.050	ug/L	0.5	0.97	100	70-130		
Perfluorohexanesulfonate (PFHxS)		0.60	0.025	ug/L	0.50	0.11	98	70-130		
Perfluorohexanoic acid (PFHxA)		0.87	0.050	ug/L	0.5	0.37	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	0.037	103	70-130		
Perfluorooctanoic acid (PFOA)		0.76	0.035	ug/L	0.5	0.27	99	70-130		
Perfluoropentanoic acid (PFPeA)		0.79	0.050	ug/L	0.5	0.32	94	70-130		

Matrix Spike (B9D0274-MSD) Source: 19D0435-16 Prepared: 04/15/19 19:56 Analyzed: 04/15/19 19:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	105	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MSD) Source: 19D0435-16 Prepared: 04/15/19 19:56 Analyzed: 04/15/19 19:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike Dup (B9D0274-MSD1) Source: 19D0380-01 Prepared: 04/15/19 17:14 Analyzed: 04/15/19 17:14

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130	3	20
Perfluorobutanoic acid (PFBA)		0.71	0.050	ug/L	0.5	0.17	107	70-130	0.4	20
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130	2	20
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130	6	20
Perfluorooctanesulfonate (PFOS)		0.49	0.025	ug/L	0.49	<	99	70-130	5	20
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130	6	20
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130	1	20

Matrix Spike (B9D0274-MSE) Source: 19D0435-17 Prepared: 04/15/19 20:12 Analyzed: 04/15/19 20:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	108	70-130		
Perfluorobutanoic acid (PFBA)		0.61	0.050	ug/L	0.5	0.091	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	107	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0274-MSF) Source: 19D0435-21 Prepared: 04/15/19 20:28 Analyzed: 04/15/19 20:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	107	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	108	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	107	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	107	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

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Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MSG) Source: 19D0435-22 Prepared: 04/15/19 20:44 Analyzed: 04/15/19 20:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	109	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	108	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	109	70-130		

Matrix Spike (B9D0274-MSH) Source: 19D0435-23 Prepared: 04/15/19 21:00 Analyzed: 04/15/19 21:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	103	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	105	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	103	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0274-MSI) Source: 19D0435-24 Prepared: 04/15/19 21:16 Analyzed: 04/15/19 21:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50	<	110	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	105	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	<	111	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	99	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	103	70-130		

Batch B9D0364 - PFCs Preparation

Blank (B9D0364-BLK1) Prepared: 04/19/19 11:36 Analyzed: 04/19/19 11:36

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0364 - PFCs Preparation

Blank (B9D0364-BLK1)

Prepared: 04/19/19 11:36 Analyzed: 04/19/19 11:36

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0364-BLK2)

Prepared: 04/19/19 14:10 Analyzed: 04/19/19 14:10

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0364-BS1)

Prepared: 04/19/19 11:28 Analyzed: 04/19/19 11:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50		98	80-120		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		102	80-120		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50		101	80-120		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		107	80-120		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49		106	80-120		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5		109	80-120		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		105	80-120		

LCS Dup (B9D0364-BSD1)

Prepared: 04/19/19 14:02 Analyzed: 04/19/19 14:02

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		99	80-120	1	20
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		102	80-120	0.1	20
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50		101	80-120	0.2	20
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5		102	80-120	5	20

FINAL REPORT

Report ID: 05012019145117

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson/Chris Pelasi	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 14:51

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0364 - PFCs Preparation

LCS Dup (B9D0364-BSD1)

Prepared: 04/19/19 14:02 Analyzed: 04/19/19 14:02

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49		105	80-120	0.7	20
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5		103	80-120	5	20
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5		105	80-120	0.6	20

Matrix Spike (B9D0364-MS1)

Source: 19D0499-03RE1

Prepared: 04/19/19 12:17 Analyzed: 04/19/19 12:17

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	98	70-130		
Perfluorobutanoic acid (PFBA)		0.66	0.050	ug/L	0.5	0.15	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.55	0.050	ug/L	0.5	<	110	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	<	110	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	106	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike Dup (B9D0364-MSD1)

Source: 19D0499-03RE1

Prepared: 04/19/19 12:25 Analyzed: 04/19/19 12:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130	2	20
Perfluorobutanoic acid (PFBA)		0.66	0.050	ug/L	0.5	0.15	101	70-130	0.04	20
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	103	70-130	1	20
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	105	70-130	4	20
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130	3	20
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5	<	107	70-130	0.7	20
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	105	70-130	3	20

FINAL REPORT

Report ID: 05012019145117

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report Quality Control

Data Qualifiers and Definitions

Z-01	Low bias demonstrated by continuing calibration verification standard, samples may also display a low bias.
WB	Relative percent difference exceeded the laboratory acceptance limit. Result less than 5 times the RL.
V4	Calibration verification standard recovery was below method acceptance limits. See comments or additional qualifiers.
L3	The spike recovery was below laboratory acceptance limits for the associated laboratory control sample and/or laboratory control sample duplicate.
J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
H2	Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
F5	The sample pH was greater than 2. The sample was analyzed within the 7 day holding time.
D2	Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
D1	Sample required dilution due to matrix. Reporting limit has been raised.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 5/1/19

Client Name: QW - MPCA - Closed Landfill Assessment

Project Code: QW

Project Name: Closed Landfill Assessment

Work Order Number: 19D0244

Report To: QW - MPCA - Closed Landfill Assessment

Mark Umholtz

520 Lafayette Rd.

Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink that reads "Paul Moyer".

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300

<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Work Order Comment: Project code is QW per M. Umholtz. -CCS 04/12/19

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
Trip Blank4	19D0244-01	QC-BLANK	04/03/19 7:30	04/04/19 10:14	1.5
834662	19D0244-02	Wtr-Ground	04/03/19 9:20	04/04/19 10:14	1.5
834663	19D0244-03	Wtr-Ground	04/03/19 10:40	04/04/19 10:14	1.5
834661	19D0244-04	Wtr-Ground	04/03/19 11:35	04/04/19 10:14	1.5
FB-2	19D0244-05	QC-BLANK	04/03/19 12:30	04/04/19 10:14	1.5
834660	19D0244-06	Wtr-Ground	04/03/19 13:30	04/04/19 10:14	1.5

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health



Chain-of-Custody Form revision 2013.0909

Work Order Number: _____ COC Type: Standard Page: _____
 Turnaround Time: Standard COC ID: _____

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MN SW-057	Program Code (MDH Lab Only):	Lab Name: Minnesota Department of Health
Project Name: 19-01567 MPCA Freeway Landfill 2019 MDH	Project Task Code: PRJ07786	Address: 601 Robert Street N.
Project Manager: Mark Umholtz 651-757-2308		St. Paul MN 55155
Potential Hazard?	If yes, add information to Sampler Comments Section	
	Phone No: 651-201-5058	



19D0244

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
 S-IVP-Integrated Vertical Profile Sample
 S-CWOP-Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES

Wtr-Ground-Groundwater
 Wtr-Surf-Surface Water
 QC-BLANK-Artificial Blank Water
 Leachate-Leachate Sample

PRESERV.

HCl
 None
 None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	VOCs EPA 8260D	PFAS by MDH555	1,4 Dioxane	Lab Sample No.	#
Trip Blank	QC-TB	4/3/19	0730			G	NW	QC-Blank	N		3		X			-01	1
834662	sample	4/3/19	0920			G	NW	Wtr-Ground	N		5		X	X	X	-02	2
834663	sample	4/3/19	1040			G	NW	Wtr-Ground	N		5		X	X	X	-03	3
834661	sample	4/3/19	1135			G	NW	Wtr-Ground	N		5		X	X	X	-04	4
FB-2	QC-FB	4/3/19	1230			G	NW	QC-Blank	N		5		X	X	X	-05	5
834660	sample	4/3/19	1330			G	NW	Wtr-Ground	N		5		X	X	X	-06	6
									N								7
									N								8
									N								9
									N								10

DATA 4/3/19

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #: _____

Receiving Comments:	Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
	David Anderson / Pace Analytical	4/3/19 / 1600	J. E. W. [Signature]	4/3/19 9:00 AM
	J. E. W. [Signature]	4/3/19 / 930	[Signature]	4/3/19 10:19

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: APR 4'19 10:14

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # _____

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can
 None Other _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No Yes

Packaging, Temperature & Radiochemical Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack # (2) Gel pack # () Dry ice None
 Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 1.5 °C IR thermometer instrument used: A10

Samples received with evidence of freezing: No; Yes _____

Rad Chem. request received: No; Yes, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Initials of person receiving parcel: JD

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No Unknown

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Sample submission details are entered in the Environmental Laboratory LIMS.

Initials of person logging in the work order request into LIMS: MKE

Final Report
Case Narrative

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected by: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/2019 15:14

Except where noted in this report, no additional comments are needed for this Work Order.

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-01

Location ID: Trip Blank4	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		103	70-130	%	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Surrogate: 4-Bromofluorobenzene		99	70-130	%	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D

FINAL REPORT

Report ID: 05012019151451

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-01

Location ID: Trip Blank4	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
4-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Acetone		<	20	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Bromomethane	V4, Z-01	<	2.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D

FINAL REPORT

Report ID: 05012019151451

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-01

Location ID: Trip Blank4	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 7:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Methylene chloride		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0098	04/05/19 13:59	04/05/19 13:59	EPA 8260D

FINAL REPORT

Report ID: 05012019151451

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-02

Location ID: 834662	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Surrogate: 4-Bromofluorobenzene		96	70-130	%	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,1,2-Trichloroethane		1.5	0.50	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-02

Location ID: 834662	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Acetone		<	20	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Bromomethane	V4, Z-01	<	2.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-02

Location ID: 834662	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Trichloroethene (TCE)		0.47	0.10	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0098	04/05/19 14:54	04/05/19 14:54	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		3.4	0.050	ug/L	1	B9D0423	04/24/19 08:00	04/26/19 13:15	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.031	0.050	ug/L	1	B9D0230	04/12/19 15:17	04/12/19 15:17	MDH 555
Perfluorobutanoic acid (PFBA)		0.078	0.050	ug/L	1	B9D0230	04/12/19 15:17	04/12/19 15:17	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-02

Location ID: 834662	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		0.12	0.025	ug/L	1	B9D0230	04/12/19 15:17	04/12/19 15:17	MDH 555
Perfluorohexanoic acid (PFHxA)		0.085	0.050	ug/L	1	B9D0230	04/12/19 15:17	04/12/19 15:17	MDH 555
Perfluorooctanesulfonate (PFOS)		0.12	0.025	ug/L	1	B9D0230	04/12/19 15:17	04/12/19 15:17	MDH 555
Perfluorooctanoic acid (PFOA)		0.93	0.035	ug/L	1	B9D0230	04/12/19 15:17	04/12/19 15:17	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.043	0.050	ug/L	1	B9D0230	04/12/19 15:17	04/12/19 15:17	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-03

Location ID: 834663	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Surrogate: 4-Bromofluorobenzene		99	70-130	%	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
1,4-Dichlorobenzene		2.3	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D

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 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-03

Location ID: 834663	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Acetone		<	20	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Benzene		7.1	0.50	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Bromomethane	V4, Z-01	<	2.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Ethyl ether		2.6	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Isopropylbenzene		1.8	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D

FINAL REPORT

Report ID: 05012019151451

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-03

Location ID: 834663	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
n-Propylbenzene		1.3	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0098	04/05/19 15:21	04/05/19 15:21	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		0.060	0.050	ug/L	1	B9D0230	04/12/19 15:33	04/12/19 15:33	MDH 555
Perfluorobutanoic acid (PFBA)		0.92	0.050	ug/L	1	B9D0230	04/12/19 15:33	04/12/19 15:33	MDH 555
Perfluorohexanesulfonate (PFHxS)		0.15	0.025	ug/L	1	B9D0230	04/12/19 15:33	04/12/19 15:33	MDH 555
Perfluorohexanoic acid (PFHxA)		1.2	0.050	ug/L	1	B9D0230	04/12/19 15:33	04/12/19 15:33	MDH 555
Perfluorooctanesulfonate (PFOS)		0.43	0.025	ug/L	1	B9D0230	04/12/19 15:33	04/12/19 15:33	MDH 555
Perfluoropentanoic acid (PFPeA)		0.62	0.050	ug/L	1	B9D0230	04/12/19 15:33	04/12/19 15:33	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Analytical Results

Program Code: QW
Program Name: Closed Landfill Assessment
Collected By: David Anderson
Collector ID: None

Project ID: PRJ07786
Facility Name/ID: MN SW-057
City: 19-01567 MPCA Freeway Landfill 2019 MDH
Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-03

Location ID: 834663
Field Name: None
Sampling Point: None
QA Type: None

Collect Date: 04/03/19
Collect Time: 10:40
Matrix: Wtr-Ground

Field Residual Chlorine Result: None
Field Fluoride Result: None
Field pH Result: None
Field PO₄ Result: None

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-03RE1

Location ID: 834663	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

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1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	13	0.099	ug/L	2	B9D0423	04/24/19 08:00	04/28/19 21:43	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorooctanoic acid (PFOA)	D1	13	0.18	ug/L	5	B9D0274	04/15/19 16:34	04/15/19 16:34	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-04

Location ID: 834661	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:35	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		104	70-130	%	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Surrogate: 4-Bromofluorobenzene		99	70-130	%	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-04

Location ID: 834661	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:35	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Acetone		<	20	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Benzene		4.2	0.50	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Bromomethane	Z-01, V4	<	2.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Chlorobenzene		3.5	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Ethyl ether		1.6	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D

FINAL REPORT

Report ID: 05012019151451

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-04

Location ID: 834661	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:35	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D
Vinyl chloride		0.24	0.050	ug/L	1	B9D0098	04/05/19 16:17	04/05/19 16:17	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		7.1	0.052	ug/L	1	B9D0423	04/24/19 08:00	04/26/19 13:47	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.022	0.050	ug/L	1	B9D0230	04/12/19 15:49	04/12/19 15:49	MDH 555
Perfluorobutanoic acid (PFBA)		0.10	0.050	ug/L	1	B9D0230	04/12/19 15:49	04/12/19 15:49	MDH 555

FINAL REPORT

Report ID: 05012019151451

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-04

Location ID: 834661	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 11:35	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		0.21	0.025	ug/L	1	B9D0230	04/12/19 15:49	04/12/19 15:49	MDH 555
Perfluorohexanoic acid (PFHxA)		0.15	0.050	ug/L	1	B9D0230	04/12/19 15:49	04/12/19 15:49	MDH 555
Perfluorooctanesulfonate (PFOS)		1.6	0.025	ug/L	1	B9D0230	04/12/19 15:49	04/12/19 15:49	MDH 555
Perfluorooctanoic acid (PFOA)		2.1	0.035	ug/L	1	B9D0230	04/12/19 15:49	04/12/19 15:49	MDH 555
Perfluoropentanoic acid (PFPeA)		0.070	0.050	ug/L	1	B9D0230	04/12/19 15:49	04/12/19 15:49	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-05

Location ID: FB-2	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Surrogate: 4-Bromofluorobenzene		95	70-130	%	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-05

Location ID: FB-2	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Acetone		<	20	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Bromomethane	V4, Z-01	<	2.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-05

Location ID: FB-2	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		7.2	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0098	04/05/19 14:26	04/05/19 14:26	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.049	ug/L	1	B9D0423	04/24/19 08:00	04/26/19 14:03	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9D0230	04/12/19 16:05	04/12/19 16:05	MDH 555
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L	1	B9D0230	04/12/19 16:05	04/12/19 16:05	MDH 555

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-05

Location ID: FB-2	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:30	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9D0230	04/12/19 16:05	04/12/19 16:05	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9D0230	04/12/19 16:05	04/12/19 16:05	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L	1	B9D0230	04/12/19 16:05	04/12/19 16:05	MDH 555
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L	1	B9D0230	04/12/19 16:05	04/12/19 16:05	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9D0230	04/12/19 16:05	04/12/19 16:05	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-06

Location ID: 834660	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		104	70-130	%	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Surrogate: 4-Bromofluorobenzene		96	70-130	%	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		102	70-130	%	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-06

Location ID: 834660	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Acetone		<	20	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Benzene		<	0.50	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Bromomethane	V4, Z-01	<	2.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-06

Location ID: 834660	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Styrene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Toluene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9D0098	04/05/19 16:44	04/05/19 16:44	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.051	ug/L	1	B9D0423	04/24/19 08:00	04/26/19 14:19	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		0.065	0.050	ug/L	1	B9D0230	04/12/19 16:21	04/12/19 16:21	MDH 555
Perfluorobutanoic acid (PFBA)		0.056	0.050	ug/L	1	B9D0230	04/12/19 16:21	04/12/19 16:21	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

MDH Sample Number: 19D0244-06

Location ID: 834660	Collect Date: 04/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		0.12	0.025	ug/L	1	B9D0230	04/12/19 16:21	04/12/19 16:21	MDH 555
Perfluorohexanoic acid (PFHxA)		0.21	0.050	ug/L	1	B9D0230	04/12/19 16:21	04/12/19 16:21	MDH 555
Perfluorooctanesulfonate (PFOS)		0.28	0.025	ug/L	1	B9D0230	04/12/19 16:21	04/12/19 16:21	MDH 555
Perfluorooctanoic acid (PFOA)		0.95	0.035	ug/L	1	B9D0230	04/12/19 16:21	04/12/19 16:21	MDH 555
Perfluoropentanoic acid (PFPeA)		0.076	0.050	ug/L	1	B9D0230	04/12/19 16:21	04/12/19 16:21	MDH 555

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Batch Summary

Samples in Batch: B9D0098 - EPA 5030B Preparation

19D0244-01 19D0244-02 19D0244-03 19D0244-04 19D0244-05 19D0244-06

Samples in Batch: B9D0230 - PFCs Preparation

19D0244-02 19D0244-03 19D0244-04 19D0244-05 19D0244-06

Samples in Batch: B9D0274 - PFCs Preparation

19D0244-03RE1

Samples in Batch: B9D0423 - 1,4 Dioxane in Water SPE

19D0244-02 19D0244-03RE1 19D0244-04 19D0244-05 19D0244-06

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

Blank (B9D0098-BLK1)

Prepared: 04/05/19 13:31 Analyzed: 04/05/19 13:31

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		104	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		98	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

Blank (B9D0098-BLK1)

Prepared: 04/05/19 13:31 Analyzed: 04/05/19 13:31

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane	V4, Z-01	<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

Blank (B9D0098-BLK1)

Prepared: 04/05/19 13:31 Analyzed: 04/05/19 13:31

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B9D0098-BS1)

Prepared: 04/05/19 11:12 Analyzed: 04/05/19 11:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		95	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.8	1.0	ug/L	10		98	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		104	70-130		
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10		95	70-130		
1,1,2-Trichloroethane		9.9	0.50	ug/L	10		99	70-130		
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		102	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		103	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		101	70-130		
1,1-Dichloropropene		10	1.0	ug/L	10		102	70-130		
1,2,3-Trichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130		
1,2,4-Trichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
1,2,4-Trimethylbenzene		9.3	1.0	ug/L	10		93	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.4	1.0	ug/L	10		94	70-130		
1,2-Dibromoethane (EDB)		9.6	0.50	ug/L	10		96	70-130		
1,2-Dichlorobenzene		9.2	1.0	ug/L	10		92	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10		104	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10		107	70-130		
1,3,5-Trimethylbenzene		9.2	1.0	ug/L	10		92	70-130		
1,3-Dichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
1,3-Dichloropropane		9.8	1.0	ug/L	10		98	70-130		
1,4-Dichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		111	70-130		
2-Chlorotoluene		9.4	1.0	ug/L	10		94	70-130		
4-Chlorotoluene		9.3	1.0	ug/L	10		93	70-130		
Acetone		110	20	ug/L	100		108	70-130		

FINAL REPORT

Report ID: 05012019151451

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

LCS (B9D0098-BS1)

Prepared: 04/05/19 11:12 Analyzed: 04/05/19 11:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		100	70-130		
Benzene		9.9	0.50	ug/L	10		99	70-130		
Bromobenzene		9.2	1.0	ug/L	10		92	70-130		
Bromochloromethane		10	1.0	ug/L	10		102	70-130		
Bromodichloromethane		10	1.0	ug/L	10		104	70-130		
Bromoform		9.3	1.0	ug/L	10		93	70-130		
Bromomethane	V4, Z-01	7.8	2.0	ug/L	10		78	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		106	70-130		
Chlorobenzene		9.7	1.0	ug/L	10		97	70-130		
Chlorodibromomethane		9.2	0.50	ug/L	10		92	70-130		
Chloroethane		11	1.0	ug/L	10		107	70-130		
Chloroform		10	1.0	ug/L	10		104	70-130		
Chloromethane		9.6	1.0	ug/L	10		96	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130		
cis-1,3-Dichloropropene		9.8	0.50	ug/L	10		98	70-130		
Dibromomethane		10	1.0	ug/L	10		104	70-130		
Dichlorodifluoromethane		11	1.0	ug/L	10		106	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130		
Ethyl ether		9.8	1.0	ug/L	10		98	70-130		
Ethylbenzene		9.6	1.0	ug/L	10		96	70-130		
Hexachlorobutadiene		9.7	0.50	ug/L	10		97	70-130		
Isopropylbenzene		9.6	1.0	ug/L	10		96	70-130		
Methyl ethyl ketone (MEK)		53	10	ug/L	50		106	70-130		
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50		102	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		103	70-130		
Methylene chloride		10	1.0	ug/L	10		103	70-130		
Naphthalene		9.3	1.0	ug/L	10		93	70-130		
n-Butylbenzene		10	1.0	ug/L	10		102	70-130		
n-Propylbenzene		9.7	1.0	ug/L	10		97	70-130		
o-Xylene		9.2	1.0	ug/L	10		92	70-130		
p&m-Xylene		9.7	1.0	ug/L	10		97	70-130		
p-Isopropyltoluene		9.6	1.0	ug/L	10		96	70-130		
sec-Butylbenzene		9.5	1.0	ug/L	10		95	70-130		
Styrene		9.1	1.0	ug/L	10		91	70-130		
tert-Butylbenzene		9.2	1.0	ug/L	10		92	70-130		

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

LCS (B9D0098-BS1)

Prepared: 04/05/19 11:12 Analyzed: 04/05/19 11:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		9.6	1.0	ug/L	10		96	70-130		
Tetrahydrofuran (THF)		110	10	ug/L	100		108	70-130		
Toluene		9.5	1.0	ug/L	10		95	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130		
trans-1,3-Dichloropropene		9.7	0.50	ug/L	10		97	70-130		
Trichloroethene (TCE)		9.7	0.10	ug/L	10		97	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10		107	70-130		
Vinyl chloride		10	0.050	ug/L	10		104	70-130		

LCS Dup (B9D0098-BSD1)

Prepared: 04/05/19 11:40 Analyzed: 04/05/19 11:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		97	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.8	1.0	ug/L	10		98	70-130	0.1	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	2	30
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10		95	70-130	0	30
1,1,2-Trichloroethane		10	0.50	ug/L	10		100	70-130	0.6	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		106	70-130	4	30
1,1-Dichloroethane		11	1.0	ug/L	10		106	70-130	3	30
1,1-Dichloroethene		10	1.0	ug/L	10		105	70-130	3	30
1,1-Dichloropropene		11	1.0	ug/L	10		107	70-130	4	30
1,2,3-Trichlorobenzene		9.4	1.0	ug/L	10		94	70-130	0.3	30
1,2,3-Trichloropropane		9.3	0.20	ug/L	10		93	70-130	2	30
1,2,4-Trichlorobenzene		9.4	1.0	ug/L	10		94	70-130	0	30
1,2,4-Trimethylbenzene		9.5	1.0	ug/L	10		95	70-130	3	30
1,2-Dibromo-3-chloropropane (DBCP)		8.9	1.0	ug/L	10		89	70-130	6	30
1,2-Dibromoethane (EDB)		9.6	0.50	ug/L	10		96	70-130	0.1	30
1,2-Dichlorobenzene		9.5	1.0	ug/L	10		95	70-130	3	30
1,2-Dichloroethane		10	0.20	ug/L	10		103	70-130	0.4	30
1,2-Dichloropropane		11	1.0	ug/L	10		109	70-130	2	30
1,3,5-Trimethylbenzene		9.5	1.0	ug/L	10		95	70-130	3	30
1,3-Dichlorobenzene		9.5	1.0	ug/L	10		95	70-130	1	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

LCS Dup (B9D0098-BSD1)

Prepared: 04/05/19 11:40 Analyzed: 04/05/19 11:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		9.8	1.0	ug/L	10		98	70-130	0.7	30
1,4-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130	2	30
2,2-Dichloropropane		11	1.0	ug/L	10		112	70-130	2	30
2-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130	2	30
4-Chlorotoluene		9.6	1.0	ug/L	10		96	70-130	3	30
Acetone		97	20	ug/L	100		97	70-130	11	30
Allyl chloride		10	1.0	ug/L	10		102	70-130	1	30
Benzene		10	0.50	ug/L	10		104	70-130	5	30
Bromobenzene		9.6	1.0	ug/L	10		96	70-130	4	30
Bromochloromethane		11	1.0	ug/L	10		105	70-130	4	30
Bromodichloromethane		11	1.0	ug/L	10		106	70-130	2	30
Bromoform		10	1.0	ug/L	10		100	70-130	7	30
Bromomethane	V4, Z-01	9.1	2.0	ug/L	10		91	70-130	15	30
Carbon tetrachloride		11	0.20	ug/L	10		109	70-130	3	30
Chlorobenzene		9.8	1.0	ug/L	10		98	70-130	1	30
Chlorodibromomethane		9.8	0.50	ug/L	10		98	70-130	6	30
Chloroethane		11	1.0	ug/L	10		114	70-130	6	30
Chloroform		11	1.0	ug/L	10		107	70-130	4	30
Chloromethane		9.9	1.0	ug/L	10		99	70-130	3	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130	1	30
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130	2	30
Dibromomethane		11	1.0	ug/L	10		107	70-130	3	30
Dichlorodifluoromethane		11	1.0	ug/L	10		111	70-130	4	30
Dichlorofluoromethane		11	1.0	ug/L	10		109	70-130	2	30
Ethyl ether		10	1.0	ug/L	10		102	70-130	4	30
Ethylbenzene		9.8	1.0	ug/L	10		98	70-130	2	30
Hexachlorobutadiene		9.7	0.50	ug/L	10		97	70-130	0.4	30
Isopropylbenzene		9.9	1.0	ug/L	10		99	70-130	3	30
Methyl ethyl ketone (MEK)		49	10	ug/L	50		97	70-130	8	30
Methyl isobutyl ketone (MIBK)		49	5.0	ug/L	50		98	70-130	4	30
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10		106	70-130	2	30
Methylene chloride		11	1.0	ug/L	10		106	70-130	3	30
Naphthalene		9.3	1.0	ug/L	10		93	70-130	0.1	30
n-Butylbenzene		10	1.0	ug/L	10		103	70-130	1	30
n-Propylbenzene		10	1.0	ug/L	10		100	70-130	3	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

LCS Dup (B9D0098-BSD1)

Prepared: 04/05/19 11:40 Analyzed: 04/05/19 11:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		9.6	1.0	ug/L	10		96	70-130	4	30
p&m-Xylene		9.8	1.0	ug/L	10		98	70-130	0.6	30
p-Isopropyltoluene		9.7	1.0	ug/L	10		97	70-130	2	30
sec-Butylbenzene		9.8	1.0	ug/L	10		98	70-130	3	30
Styrene		9.2	1.0	ug/L	10		92	70-130	1	30
tert-Butylbenzene		9.5	1.0	ug/L	10		95	70-130	3	30
Tetrachloroethene		9.7	1.0	ug/L	10		97	70-130	0.6	30
Tetrahydrofuran (THF)		99	10	ug/L	100		99	70-130	8	30
Toluene		9.7	1.0	ug/L	10		97	70-130	2	30
trans-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130	3	30
trans-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130	4	30
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130	4	30
Trichlorofluoromethane		11	1.0	ug/L	10		112	70-130	5	30
Vinyl chloride		11	0.050	ug/L	10		111	70-130	6	30

Duplicate (B9D0098-DUP1)

Source: 19D0244-03

Prepared: 04/05/19 15:49 Analyzed: 04/05/19 15:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		99	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		102	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

Duplicate (B9D0098-DUP1)		Source: 19D0244-03		Prepared: 04/05/19 15:49		Analyzed: 04/05/19 15:49		RPD	RPD Limit
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<			30
1,2-Dichlorobenzene		0.26	1.0	ug/L		<		0	30
1,2-Dichloroethane		<	0.20	ug/L		<			30
1,2-Dichloropropane		<	1.0	ug/L		<			30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<			30
1,3-Dichlorobenzene		<	1.0	ug/L		<			30
1,3-Dichloropropane		<	1.0	ug/L		<			30
1,4-Dichlorobenzene		2.2	1.0	ug/L		2.3		6	30
2,2-Dichloropropane		<	1.0	ug/L		<			30
2-Chlorotoluene		<	1.0	ug/L		<			30
4-Chlorotoluene		<	1.0	ug/L		<			30
Acetone		4.0	20	ug/L		<		12	30
Allyl chloride		<	1.0	ug/L		<			30
Benzene		6.8	0.50	ug/L		7.1		4	30
Bromobenzene		<	1.0	ug/L		<			30
Bromochloromethane		<	1.0	ug/L		<			30
Bromodichloromethane		<	1.0	ug/L		<			30
Bromoform		<	1.0	ug/L		<			30
Bromomethane	V4, Z-01	<	2.0	ug/L		<			30
Carbon tetrachloride		<	0.20	ug/L		<			30
Chlorobenzene		0.91	1.0	ug/L		<		1	30
Chlorodibromomethane		<	0.50	ug/L		<			30
Chloroethane		<	1.0	ug/L		<			30
Chloroform		<	1.0	ug/L		<			30
Chloromethane		<	1.0	ug/L		<			30
cis-1,2-Dichloroethene		<	1.0	ug/L		<			30
cis-1,3-Dichloropropene		<	0.50	ug/L		<			30
Dibromomethane		<	1.0	ug/L		<			30
Dichlorodifluoromethane		<	1.0	ug/L		<			30
Dichlorofluoromethane		<	1.0	ug/L		<			30
Ethyl ether		2.4	1.0	ug/L		2.6		7	30
Ethylbenzene		<	1.0	ug/L		<			30
Hexachlorobutadiene		<	0.50	ug/L		<			30
Isopropylbenzene		1.8	1.0	ug/L		1.8		3	30
Methyl ethyl ketone (MEK)		<	10	ug/L		<			30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

Duplicate (B9D0098-DUP1)		Source: 19D0244-03		Prepared: 04/05/19 15:49 Analyzed: 04/05/19 15:49						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		0.23	1.0	ug/L		<			0	30
n-Butylbenzene		0.35	1.0	ug/L		<			6	30
n-Propylbenzene		1.3	1.0	ug/L		1.3			3	30
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		0.28	1.0	ug/L		<			13	30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		0.67	1.0	ug/L		<			2	30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		0.36	1.0	ug/L		<			3	30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		9.3	10	ug/L		<			3	30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		<	0.10	ug/L		<				30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		0.030	0.050	ug/L		<			29	30

Matrix Spike (B9D0098-MS1)		Source: 19D0244-02		Prepared: 04/05/19 12:08 Analyzed: 04/05/19 12:08						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		95	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10	<	100	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	113	70-130		
1,1,2,2-Tetrachloroethane		9.6	0.50	ug/L	10	<	96	70-130		
1,1,2-Trichloroethane		11	0.50	ug/L	10	1.5	100	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10	<	115	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	111	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	113	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10	<	114	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

Matrix Spike (B9D0098-MS1)

Source: 19D0244-02

Prepared: 04/05/19 12:08 Analyzed: 04/05/19 12:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		9.5	1.0	ug/L	10	<	95	70-130		
1,2,3-Trichloropropane		9.4	0.20	ug/L	10	<	94	70-130		
1,2,4-Trichlorobenzene		9.7	1.0	ug/L	10	<	97	70-130		
1,2,4-Trimethylbenzene		9.8	1.0	ug/L	10	<	98	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		8.4	1.0	ug/L	10	<	84	70-130		
1,2-Dibromoethane (EDB)		9.8	0.50	ug/L	10	<	98	70-130		
1,2-Dichlorobenzene		9.6	1.0	ug/L	10	<	96	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10	<	105	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10	<	110	70-130		
1,3,5-Trimethylbenzene		9.9	1.0	ug/L	10	<	99	70-130		
1,3-Dichlorobenzene		9.9	1.0	ug/L	10	<	99	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10	<	100	70-130		
1,4-Dichlorobenzene		9.9	1.0	ug/L	10	<	99	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	122	70-130		
2-Chlorotoluene		9.9	1.0	ug/L	10	<	99	70-130		
4-Chlorotoluene		9.8	1.0	ug/L	10	<	98	70-130		
Acetone		100	20	ug/L	100	<	100	70-130		
Allyl chloride		11	1.0	ug/L	10	<	111	70-130		
Benzene		11	0.50	ug/L	10	<	108	70-130		
Bromobenzene		9.7	1.0	ug/L	10	<	97	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	107	70-130		
Bromodichloromethane		11	1.0	ug/L	10	<	108	70-130		
Bromoform		10	1.0	ug/L	10	<	101	70-130		
Bromomethane	V4, Z-01	9.9	2.0	ug/L	10	<	99	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	118	70-130		
Chlorobenzene		10	1.0	ug/L	10	<	103	70-130		
Chlorodibromomethane		9.9	0.50	ug/L	10	<	99	70-130		
Chloroethane		12	1.0	ug/L	10	<	123	70-130		
Chloroform		11	1.0	ug/L	10	<	110	70-130		
Chloromethane		11	1.0	ug/L	10	<	107	70-130		
cis-1,2-Dichloroethene		11	1.0	ug/L	10	<	108	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10	<	101	70-130		
Dibromomethane		11	1.0	ug/L	10	<	107	70-130		
Dichlorodifluoromethane		13	1.0	ug/L	10	<	126	70-130		
Dichlorofluoromethane		12	1.0	ug/L	10	<	118	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0098 - EPA 5030B Preparation

Matrix Spike (B9D0098-MS1)

Source: 19D0244-02

Prepared: 04/05/19 12:08 Analyzed: 04/05/19 12:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ethyl ether		11	1.0	ug/L	10	<	104	70-130		
Ethylbenzene		10	1.0	ug/L	10	<	104	70-130		
Hexachlorobutadiene		9.9	0.50	ug/L	10	<	99	70-130		
Isopropylbenzene		10	1.0	ug/L	10	<	104	70-130		
Methyl ethyl ketone (MEK)		50	10	ug/L	50	<	99	70-130		
Methyl isobutyl ketone (MIBK)		50	5.0	ug/L	50	<	100	70-130		
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10	<	107	70-130		
Methylene chloride		11	1.0	ug/L	10	<	110	70-130		
Naphthalene		9.3	1.0	ug/L	10	<	93	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	110	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	105	70-130		
o-Xylene		9.9	1.0	ug/L	10	<	99	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	106	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10	<	102	70-130		
sec-Butylbenzene		10	1.0	ug/L	10	<	104	70-130		
Styrene		9.6	1.0	ug/L	10	<	96	70-130		
tert-Butylbenzene		10	1.0	ug/L	10	<	100	70-130		
Tetrachloroethene		10	1.0	ug/L	10	<	105	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100	<	100	70-130		
Toluene		10	1.0	ug/L	10	<	102	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	110	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10	<	102	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	0.47	106	70-130		
Trichlorofluoromethane		13	1.0	ug/L	10	<	125	70-130		
Vinyl chloride		12	0.050	ug/L	10	<	124	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0423 - 1,4 Dioxane in Water SPE

Blank (B9D0423-BLK1)

Prepared: 04/24/19 08:00 Analyzed: 04/26/19 11:55

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.051	ug/L						

LCS (B9D0423-BS1)

Prepared: 04/24/19 08:00 Analyzed: 04/26/19 12:11

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.21	0.051	ug/L	0.20		100	80-120		

Duplicate (B9D0423-DUP1)

Source: 19D0434-02

Prepared: 04/24/19 08:00 Analyzed: 04/26/19 14:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.23	0.052	ug/L		0.20			15	30

Matrix Spike (B9D0423-MS1)

Source: 19D0434-03

Prepared: 04/24/19 08:00 Analyzed: 04/26/19 15:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.48	0.051	ug/L	0.45	<	105	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Blank (B9D0230-BLK1)

Prepared: 04/12/19 12:59 Analyzed: 04/12/19 12:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0230-BLK2)

Prepared: 04/12/19 18:46 Analyzed: 04/12/19 18:46

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0230-BS1)

Prepared: 04/12/19 12:51 Analyzed: 04/12/19 12:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		101	80-120		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		103	80-120		
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50		109	80-120		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		107	80-120		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49		104	80-120		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5		105	80-120		
Perfluoropentanoic acid (PFPeA)		0.49	0.050	ug/L	0.5		98	80-120		

LCS Dup (B9D0230-BSD1)

Prepared: 04/12/19 18:38 Analyzed: 04/12/19 18:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50		107	80-120	6	20
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5		106	80-120	3	20
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50		103	80-120	6	20

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

LCS Dup (B9D0230-BSD1)

Prepared: 04/12/19 18:38 Analyzed: 04/12/19 18:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5		100	80-120	6	20
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49		105	80-120	0.8	20
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5		111	80-120	6	20
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		105	80-120	6	20

Duplicate (B9D0230-DUP1)

Source: 19D0067-02

Prepared: 04/12/19 13:24 Analyzed: 04/12/19 13:24

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)	WB, J	0.019	0.050	ug/L		<			23	20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L		<				20
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L		<				20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B9D0230-MS1)

Source: 19D0067-02

Prepared: 04/12/19 13:16 Analyzed: 04/12/19 13:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	99	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	107	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	101	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0230-MS2)

Source: 19D0067-03

Prepared: 04/12/19 13:48 Analyzed: 04/12/19 13:48

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.55	0.050	ug/L	0.5	<	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	99	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	99	70-130		
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5	<	109	70-130		

FINAL REPORT

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MS2) Source: 19D0067-03 Prepared: 04/12/19 13:48 Analyzed: 04/12/19 13:48

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0230-MS3) Source: 19D0067-04 Prepared: 04/12/19 14:04 Analyzed: 04/12/19 14:04

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.57	0.050	ug/L	0.5	0.056	103	70-130		
Perfluorohexanesulfonate (PFHxS)		0.56	0.025	ug/L	0.50	<	112	70-130		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5	<	94	70-130		
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	100	70-130		
Perfluorooctanoic acid (PFOA)		0.57	0.035	ug/L	0.5	0.068	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0230-MS4) Source: 19D0067-05 Prepared: 04/12/19 14:20 Analyzed: 04/12/19 14:20

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.57	0.050	ug/L	0.50	0.066	101	70-130		
Perfluorobutanoic acid (PFBA)		1.3	0.050	ug/L	0.5	0.78	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.60	0.025	ug/L	0.50	0.087	103	70-130		
Perfluorohexanoic acid (PFHxA)		0.84	0.050	ug/L	0.5	0.30	108	70-130		
Perfluorooctanesulfonate (PFOS)		0.59	0.025	ug/L	0.49	0.063	105	70-130		
Perfluorooctanoic acid (PFOA)		0.75	0.035	ug/L	0.5	0.20	110	70-130		
Perfluoropentanoic acid (PFPeA)		0.73	0.050	ug/L	0.5	0.24	97	70-130		

Matrix Spike (B9D0230-MS6) Source: 19D0067-07 Prepared: 04/12/19 14:52 Analyzed: 04/12/19 14:52

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)	D1	2.8	0.25	ug/L	2.50	<	110	70-130		
Perfluorobutanoic acid (PFBA)	D1	6.4	0.25	ug/L	2.5	4.0	96	70-130		
Perfluorohexanesulfonate (PFHxS)	D1	2.9	0.12	ug/L	2.50	0.26	105	70-130		
Perfluorohexanoic acid (PFHxA)	D1	3.3	0.25	ug/L	2.5	0.80	98	70-130		
Perfluorooctanesulfonate (PFOS)	D1	3.0	0.12	ug/L	2.49	0.48	101	70-130		
Perfluorooctanoic acid (PFOA)	D1	3.1	0.18	ug/L	2.5	0.53	101	70-130		
Perfluoropentanoic acid (PFPeA)	D1	3.0	0.25	ug/L	2.5	0.59	98	70-130		

FINAL REPORT

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MS7) Source: 19D0067-08 Prepared: 04/12/19 15:09 Analyzed: 04/12/19 15:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	99	70-130		
Perfluorobutanoic acid (PFBA)		0.59	0.050	ug/L	0.5	0.088	100	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	0.029	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.56	0.050	ug/L	0.5	0.051	102	70-130		
Perfluorooctanesulfonate (PFOS)		0.57	0.025	ug/L	0.49	0.046	105	70-130		
Perfluorooctanoic acid (PFOA)		0.62	0.035	ug/L	0.5	0.061	112	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	100	70-130		

Matrix Spike (B9D0230-MS8) Source: 19D0244-02 Prepared: 04/12/19 15:25 Analyzed: 04/12/19 15:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50	<	104	70-130		
Perfluorobutanoic acid (PFBA)		0.59	0.050	ug/L	0.5	0.078	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.63	0.025	ug/L	0.50	0.12	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.59	0.050	ug/L	0.5	0.085	101	70-130		
Perfluorooctanesulfonate (PFOS)		0.67	0.025	ug/L	0.49	0.12	111	70-130		
Perfluorooctanoic acid (PFOA)		1.4	0.035	ug/L	0.5	0.93	84	70-130		
Perfluoropentanoic acid (PFPeA)		0.57	0.050	ug/L	0.5	<	106	70-130		

Matrix Spike (B9D0230-MS9) Source: 19D0244-03 Prepared: 04/12/19 15:41 Analyzed: 04/12/19 15:41

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.58	0.050	ug/L	0.50	0.060	103	70-130		
Perfluorobutanoic acid (PFBA)		1.4	0.050	ug/L	0.5	0.92	92	70-130		
Perfluorohexanesulfonate (PFHxS)		0.72	0.025	ug/L	0.50	0.15	113	70-130		
Perfluorohexanoic acid (PFHxA)		1.7	0.050	ug/L	0.5	1.2	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.92	0.025	ug/L	0.49	0.43	98	70-130		
Perfluoropentanoic acid (PFPeA)		1.1	0.050	ug/L	0.5	0.62	91	70-130		

Matrix Spike (B9D0230-MSA) Source: 19D0244-04 Prepared: 04/12/19 15:57 Analyzed: 04/12/19 15:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.63	0.050	ug/L	0.5	0.10	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.74	0.025	ug/L	0.50	0.21	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.66	0.050	ug/L	0.5	0.15	102	70-130		

FINAL REPORT

Report ID: 05012019151451

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MSA) Source: 19D0244-04 Prepared: 04/12/19 15:57 Analyzed: 04/12/19 15:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanesulfonate (PFOS)		2.2	0.025	ug/L	0.49	1.6	111	70-130		
Perfluorooctanoic acid (PFOA)		2.6	0.035	ug/L	0.5	2.1	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.57	0.050	ug/L	0.5	0.070	100	70-130		

Matrix Spike (B9D0230-MSB) Source: 19D0244-05 Prepared: 04/12/19 16:13 Analyzed: 04/12/19 16:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5	<	100	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	107	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0230-MSC) Source: 19D0244-06 Prepared: 04/12/19 16:29 Analyzed: 04/12/19 16:29

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.59	0.050	ug/L	0.50	0.065	106	70-130		
Perfluorobutanoic acid (PFBA)		0.59	0.050	ug/L	0.5	0.056	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.65	0.025	ug/L	0.50	0.12	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.68	0.050	ug/L	0.5	0.21	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.79	0.025	ug/L	0.49	0.28	103	70-130		
Perfluorooctanoic acid (PFOA)		1.4	0.035	ug/L	0.5	0.95	89	70-130		
Perfluoropentanoic acid (PFPeA)		0.59	0.050	ug/L	0.5	0.076	103	70-130		

Matrix Spike (B9D0230-MSD) Source: 19D0293-01 Prepared: 04/12/19 16:45 Analyzed: 04/12/19 16:45

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.69	0.050	ug/L	0.5	0.20	99	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.56	0.025	ug/L	0.49	0.043	103	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	96	70-130		
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5	<	100	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike Dup (B9D0230-MSD1)

Source: 19D0067-02

Prepared: 04/12/19 13:32 Analyzed: 04/12/19 13:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50	<	109	70-130	4	20
Perfluorobutanoic acid (PFBA)		0.55	0.050	ug/L	0.5	<	105	70-130	5	20
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	101	70-130	6	20
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	97	70-130	7	20
Perfluorooctanesulfonate (PFOS)		0.50	0.025	ug/L	0.49	<	100	70-130	0.7	20
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	105	70-130	7	20
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5	<	100	70-130	5	20

Matrix Spike (B9D0230-MSE)

Source: 19D0293-02

Prepared: 04/12/19 17:01 Analyzed: 04/12/19 17:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	101	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	105	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	105	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	106	70-130		

Matrix Spike (B9D0230-MSF)

Source: 19D0293-03

Prepared: 04/12/19 17:17 Analyzed: 04/12/19 17:17

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	99	70-130		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	96	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	107	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0230-MSG)

Source: 19D0293-04

Prepared: 04/12/19 17:34 Analyzed: 04/12/19 17:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.72	0.050	ug/L	0.5	0.20	104	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MSG) Source: 19D0293-04 Prepared: 04/12/19 17:34 Analyzed: 04/12/19 17:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	99	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.55	0.035	ug/L	0.5	<	109	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0230-MSH) Source: 19D0293-05 Prepared: 04/12/19 17:50 Analyzed: 04/12/19 17:50

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.56	0.050	ug/L	0.50	<	111	70-130		
Perfluorobutanoic acid (PFBA)		0.69	0.050	ug/L	0.5	0.20	98	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.47	0.050	ug/L	0.5	<	95	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	105	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	105	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike (B9D0230-MSI) Source: 19D0293-06 Prepared: 04/12/19 18:06 Analyzed: 04/12/19 18:06

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.74	0.050	ug/L	0.5	0.24	101	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	107	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.56	0.025	ug/L	0.49	0.032	107	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	102	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0230-MSJ) Source: 19D0293-07 Prepared: 04/12/19 18:22 Analyzed: 04/12/19 18:22

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	100	70-130		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5	<	97	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0230 - PFCs Preparation

Matrix Spike (B9D0230-MSJ)		Source: 19D0293-07		Prepared: 04/12/19 18:22 Analyzed: 04/12/19 18:22						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	108	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	107	70-130		

Batch B9D0274 - PFCs Preparation

Blank (B9D0274-BLK1)		Prepared: 04/15/19 16:09 Analyzed: 04/15/19 16:09								
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9D0274-BLK2)		Prepared: 04/15/19 21:40 Analyzed: 04/15/19 21:40								
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9D0274-BS1)		Prepared: 04/15/19 16:01 Analyzed: 04/15/19 16:01								
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50		102	80-120		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5		105	80-120		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50		102	80-120		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		106	80-120		
Perfluorooctanesulfonate (PFOS)		0.54	0.025	ug/L	0.49		108	80-120		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5		104	80-120		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

LCS (B9D0274-BS1)

Prepared: 04/15/19 16:01 Analyzed: 04/15/19 16:01

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		105	80-120		

LCS Dup (B9D0274-BSD1)

Prepared: 04/15/19 21:32 Analyzed: 04/15/19 21:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		100	80-120	2	20
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5		108	80-120	3	20
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50		110	80-120	7	20
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5		106	80-120	0.6	20
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49		104	80-120	3	20
Perfluorooctanoic acid (PFOA)		0.48	0.035	ug/L	0.5		97	80-120	7	20
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5		108	80-120	3	20

Duplicate (B9D0274-DUP1)

Source: 19D0380-01

Prepared: 04/15/19 17:06 Analyzed: 04/15/19 17:06

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L		<				20
Perfluorobutanoic acid (PFBA)		0.19	0.050	ug/L		0.17			10	20
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L		<				20
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L		<				20
Perfluorooctanesulfonate (PFOS)		<	0.025	ug/L		<				20
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L		<				20
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L		<				20

Matrix Spike (B9D0274-MS1)

Source: 19D0380-01

Prepared: 04/15/19 16:58 Analyzed: 04/15/19 16:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.70	0.050	ug/L	0.5	0.17	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	106	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	106	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MS3) Source: 19D0244-03RE1 Prepared: 04/15/19 16:42 Analyzed: 04/15/19 16:42

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	D1	16	0.18	ug/L	2.5	13	110	70-130		

Matrix Spike (B9D0274-MS4) Source: 19D0380-02 Prepared: 04/15/19 17:30 Analyzed: 04/15/19 17:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	103	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.025	ug/L	0.49	<	102	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	104	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	107	70-130		

Matrix Spike (B9D0274-MS5) Source: 19D0389-01 Prepared: 04/15/19 17:47 Analyzed: 04/15/19 17:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.55	0.050	ug/L	0.5	<	109	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	103	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	108	70-130		

Matrix Spike (B9D0274-MS6) Source: 19D0389-02 Prepared: 04/15/19 18:03 Analyzed: 04/15/19 18:03

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.75	0.050	ug/L	0.5	0.21	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.57	0.050	ug/L	0.5	<	115	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	<	111	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	106	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	109	70-130		

FINAL REPORT

Report ID: 05012019151451

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MS7) Source: 19D0389-03 Prepared: 04/15/19 18:19 Analyzed: 04/15/19 18:19

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.75	0.050	ug/L	0.5	0.20	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	103	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0274-MS8) Source: 19D0434-02 Prepared: 04/15/19 18:35 Analyzed: 04/15/19 18:35

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	109	70-130		
Perfluorobutanoic acid (PFBA)		0.57	0.050	ug/L	0.5	<	111	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	101	70-130		
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.47	0.035	ug/L	0.5	<	95	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0274-MS9) Source: 19D0434-09 Prepared: 04/15/19 18:51 Analyzed: 04/15/19 18:51

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		1.3	0.050	ug/L	0.5	0.80	97	70-130		
Perfluorohexanesulfonate (PFHxS)		0.55	0.025	ug/L	0.50	0.031	104	70-130		
Perfluorohexanoic acid (PFHxA)		0.76	0.050	ug/L	0.5	0.26	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.58	0.035	ug/L	0.5	0.075	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.76	0.050	ug/L	0.5	0.26	100	70-130		

Matrix Spike (B9D0274-MSA) Source: 19D0435-07 Prepared: 04/15/19 19:07 Analyzed: 04/15/19 19:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.49	0.050	ug/L	0.50	<	99	70-130		
Perfluorobutanoic acid (PFBA)		0.56	0.050	ug/L	0.5	<	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		

FINAL REPORT

Report ID: 05012019151451

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MSA) Source: 19D0435-07 Prepared: 04/15/19 19:07 Analyzed: 04/15/19 19:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	108	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	107	70-130		

Matrix Spike (B9D0274-MSB) Source: 19D0435-09 Prepared: 04/15/19 19:23 Analyzed: 04/15/19 19:23

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.63	0.050	ug/L	0.5	0.084	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.57	0.025	ug/L	0.50	<	113	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.025	ug/L	0.49	<	104	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	94	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130		

Matrix Spike (B9D0274-MSC) Source: 19D0435-10 Prepared: 04/15/19 19:39 Analyzed: 04/15/19 19:39

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.58	0.050	ug/L	0.50	<	110	70-130		
Perfluorobutanoic acid (PFBA)		1.5	0.050	ug/L	0.5	0.97	100	70-130		
Perfluorohexanesulfonate (PFHxS)		0.60	0.025	ug/L	0.50	0.11	98	70-130		
Perfluorohexanoic acid (PFHxA)		0.87	0.050	ug/L	0.5	0.37	100	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	0.037	103	70-130		
Perfluorooctanoic acid (PFOA)		0.76	0.035	ug/L	0.5	0.27	99	70-130		
Perfluoropentanoic acid (PFPeA)		0.79	0.050	ug/L	0.5	0.32	94	70-130		

Matrix Spike (B9D0274-MSD) Source: 19D0435-16 Prepared: 04/15/19 19:56 Analyzed: 04/15/19 19:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	104	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	105	70-130		

FINAL REPORT

Report ID: 05012019151451

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MSD) Source: 19D0435-16 Prepared: 04/15/19 19:56 Analyzed: 04/15/19 19:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike Dup (B9D0274-MSD1) Source: 19D0380-01 Prepared: 04/15/19 17:14 Analyzed: 04/15/19 17:14

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	104	70-130	3	20
Perfluorobutanoic acid (PFBA)		0.71	0.050	ug/L	0.5	0.17	107	70-130	0.4	20
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130	2	20
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130	6	20
Perfluorooctanesulfonate (PFOS)		0.49	0.025	ug/L	0.49	<	99	70-130	5	20
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	100	70-130	6	20
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	105	70-130	1	20

Matrix Spike (B9D0274-MSE) Source: 19D0435-17 Prepared: 04/15/19 20:12 Analyzed: 04/15/19 20:12

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	108	70-130		
Perfluorobutanoic acid (PFBA)		0.61	0.050	ug/L	0.5	0.091	104	70-130		
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50	<	105	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5	<	107	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	103	70-130		

Matrix Spike (B9D0274-MSF) Source: 19D0435-21 Prepared: 04/15/19 20:28 Analyzed: 04/15/19 20:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	107	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.54	0.025	ug/L	0.50	<	108	70-130		
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	108	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	107	70-130		
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.54	0.050	ug/L	0.5	<	107	70-130		

FINAL REPORT

Report ID: 05012019151451

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 05/01/19 15:14

Results were produced by Minnesota Department of Health, except where noted.

Batch B9D0274 - PFCs Preparation

Matrix Spike (B9D0274-MSG) Source: 19D0435-22 Prepared: 04/15/19 20:44 Analyzed: 04/15/19 20:44

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	109	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	108	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	106	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	106	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.55	0.050	ug/L	0.5	<	109	70-130		

Matrix Spike (B9D0274-MSH) Source: 19D0435-23 Prepared: 04/15/19 21:00 Analyzed: 04/15/19 21:00

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	101	70-130		
Perfluorobutanoic acid (PFBA)		0.54	0.050	ug/L	0.5	<	109	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	103	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	107	70-130		
Perfluorooctanesulfonate (PFOS)		0.53	0.025	ug/L	0.49	<	105	70-130		
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	103	70-130		
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5	<	104	70-130		

Matrix Spike (B9D0274-MSI) Source: 19D0435-24 Prepared: 04/15/19 21:16 Analyzed: 04/15/19 21:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50	<	110	70-130		
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	100	70-130		
Perfluorohexanoic acid (PFHxA)		0.53	0.050	ug/L	0.5	<	105	70-130		
Perfluorooctanesulfonate (PFOS)		0.55	0.025	ug/L	0.49	<	111	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	99	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	103	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

Z-01	Low bias demonstrated by continuing calibration verification standard, samples may also display a low bias.
WB	Relative percent difference exceeded the laboratory acceptance limit. Result less than 5 times the RL.
V4	Calibration verification standard recovery was below method acceptance limits. See comments or additional qualifiers.
J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
D2	Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
D1	Sample required dilution due to matrix. Reporting limit has been raised.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 6/19/19
Client Name: QW - MPCA - Closed Landfill Assessment
Project Code: QW
Project Name: Closed Landfill Assessment

Work Order Number: 19E1829

Report To: QW - MPCA - Closed Landfill Assessment
Mark Umholtz
520 Lafayette Rd.
Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink that reads "Paul Moyer".

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300
<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Work Order Comment: Program Code is QW per M. Umholtz & D. Anderson. -CTS 05/23/19

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
472759	19E1829-01	Wtr-Ground	05/21/19 10:45	05/23/19 11:26	2.8
603286	19E1829-02	Wtr-Ground	05/21/19 12:50	05/23/19 11:26	2.8
603284	19E1829-03	Wtr-Ground	05/21/19 14:20	05/23/19 11:26	2.8
603283	19E1829-04	Wtr-Ground	05/21/19 15:40	05/23/19 11:26	2.8
813763	19E1829-05	Wtr-Ground	05/22/19 12:00	05/23/19 11:26	2.8

Field ID	MDH Sample Number	Receiving Comments
472759	19E1829-01	(OFMW-1)
603286	19E1829-02	(MW-97-9)
603284	19E1829-03	(MW-97-7)
603283	19E1829-04	(MW-97-3)
813763	19E1829-05	(MW-3)

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health



Chain-of-Custody Form revision 2013.0909

Work Order Number: _____ COC Type: Standard
 Turnaround Time: Standard COC ID: _____

Page: 4

PROJECT/CLIENT INFO

LABORATORY

Facility Code:	MN SW-057	Program Code (MDH Lab Only):		Lab Name:	Minnesota Department of Health		
Project Name:	19-01567 MPCA Freeway Landfill 2019 MDH	Project Task Code:	PRJ07786	Address:	601 Robert Street N.		
Project Manager:	Mark Umholtz	651-757-2308		St. Paul	MN	55155	
Potential Hazard?	If yes, add information to Sampler Comments Section			Phone No:	651-201-5058		



19E1829

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
 S-IVP-Integrated Vertical Profile Sample
 S-CWOP-Composite Sample

QC-FB-Field Blank Sample
 QC-FR-Field Replicate Sample
 QC-TB-Trip Blank Sample

LAB MATRIX CODES

DW-Drinking Water
 NW-Non-potable Water
 SD-Soil/Solid
 WP-Wipe
 AR-Air
 BL-Biological Material
 OT-Other
 TS-Tissue

FIELD MATRIX CODES

Wtr-Ground-Groundwater
 Wtr-Surf-Surface Water
 QC-BLANK-Artificial Blank Water
 Leachate-Leachate Sample

PRESERV.

HCl

None

None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS			Lab Sample No.	#
												VOCs EPA 8260D	PFAS by MDH555	1,4 Dioxane		
472759	sample	5/21/19	1045			G	NW	Wtr-Ground	N	(OFMW-1)	5	✓	✓	✓	-01	1
603286	sample	5/21/19	1250			G	NW	Wtr-Ground	N	(MW-97-9)	5	✓	✓	✓	-02	2
603284	sample	5/21/19	1420			G	NW	Wtr-Ground	N	(MW-97-7)	5	✓	✓	✓	-03	3
603283	sample	5/21/19	1540			G	NW	Wtr-Ground	N	(MW-97-3)	5	✓	✓	✓	-04	4
813763	sample	5/22/19	1200			G	NW	Wtr-Ground	N	(MW-3)	5	✓	✓	✓	-05	5
									N							6
									N							7
									N							8
									N							9
									N							10

DVA 5/22/19

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #: _____

Receiving Comments: _____

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <u>David Anderson / Pace Analytical</u>	<u>5/22/19 / 1400</u>	<u>David Anderson / MDH</u>	<u>5/23/19 / 1120</u>

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: MAY 23 '19 11:26

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # _____

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can
 None Other _____ Info: _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No; Yes

Packaging & Temperature Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack #() Gel pack #() Dry ice None
 Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 2-8 °C IR thermometer instrument used: A10

Samples received without evidence of freezing: Yes; No _____

Initials of person receiving parcel: UD

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes; No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No; Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No; Unknown _____

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Rad Chem. request received: Yes; No, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Rad Chem. meter calibration date verified: Yes; No

Sample submission details are entered in the Environmental Laboratory LIMS.
Initials of person logging in the work order request into LIMS: B

Final Report
Case Narrative

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected by: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/2019 9:43

Except where noted in this report, no additional comments are needed for this Work Order.

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-01

Location ID: 472759	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:45	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: (0FMW-1)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Surrogate: 4-Bromofluorobenzene		103	70-130	%	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		107	70-130	%	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D

FINAL REPORT

Report ID: 06192019 94335

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-01

Location ID: 472759	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:45	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (0FMW-1)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
4-Chlorotoluene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Acetone		<	20	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Benzene		<	0.50	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-01

Location ID: 472759	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:45	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (0FMW-1)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Methylene chloride		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Styrene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Toluene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9E0506	05/28/19 14:17	05/28/19 14:17	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.70	0.049	ug/L	1	B9F0115	06/07/19 08:00	06/07/19 18:55	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.007	0.050	ug/L	1	B9E0550	05/28/19 12:26	05/28/19 12:26	MDH 555

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-01

Location ID: 472759	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:45	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (0FMW-1)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanoic acid (PFBA)	J	0.041	0.050	ug/L	1	B9E0550	05/28/19 12:26	05/28/19 12:26	MDH 555
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9E0550	05/28/19 12:26	05/28/19 12:26	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.034	0.050	ug/L	1	B9E0550	05/28/19 12:26	05/28/19 12:26	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L	1	B9E0550	05/28/19 12:26	05/28/19 12:26	MDH 555
Perfluorooctanoic acid (PFOA)		0.11	0.035	ug/L	1	B9E0550	05/28/19 12:26	05/28/19 12:26	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.023	0.050	ug/L	1	B9E0550	05/28/19 12:26	05/28/19 12:26	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-02

Location ID: 603286	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-9)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Surrogate: 4-Bromofluorobenzene		104	70-130	%	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		107	70-130	%	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-02

Location ID: 603286	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-9)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Acetone		<	20	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Benzene		<	0.50	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-02

Location ID: 603286	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-9)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Styrene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Toluene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9E0506	05/28/19 14:45	05/28/19 14:45	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.36	0.049	ug/L	1	B9F0115	06/07/19 08:00	06/07/19 19:11	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9E0550	05/28/19 12:51	05/28/19 12:51	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.022	0.050	ug/L	1	B9E0550	05/28/19 12:51	05/28/19 12:51	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-02

Location ID: 603286	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:50	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-9)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9E0550	05/28/19 12:51	05/28/19 12:51	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9E0550	05/28/19 12:51	05/28/19 12:51	MDH 555
Perfluorooctanesulfonate (PFOS)		0.037	0.015	ug/L	1	B9E0550	05/28/19 12:51	05/28/19 12:51	MDH 555
Perfluorooctanoic acid (PFOA)		0.077	0.035	ug/L	1	B9E0550	05/28/19 12:51	05/28/19 12:51	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.006	0.050	ug/L	1	B9E0550	05/28/19 12:51	05/28/19 12:51	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-03

Location ID: 603284	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-7)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Surrogate: 4-Bromofluorobenzene		104	70-130	%	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		109	70-130	%	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-03

Location ID: 603284	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-7)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Acetone		<	20	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Benzene		<	0.50	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-03

Location ID: 603284	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-7)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Styrene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Toluene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9E0506	05/28/19 15:41	05/28/19 15:41	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		<	0.051	ug/L	1	B9F0115	06/07/19 08:00	06/07/19 19:28	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.008	0.050	ug/L	1	B9E0550	05/28/19 12:59	05/28/19 12:59	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.022	0.050	ug/L	1	B9E0550	05/28/19 12:59	05/28/19 12:59	MDH 555

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-03

Location ID: 603284	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:20	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-7)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)	J	0.006	0.025	ug/L	1	B9E0550	05/28/19 12:59	05/28/19 12:59	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.029	0.050	ug/L	1	B9E0550	05/28/19 12:59	05/28/19 12:59	MDH 555
Perfluorooctanesulfonate (PFOS)		0.037	0.015	ug/L	1	B9E0550	05/28/19 12:59	05/28/19 12:59	MDH 555
Perfluorooctanoic acid (PFOA)		0.069	0.035	ug/L	1	B9E0550	05/28/19 12:59	05/28/19 12:59	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.015	0.050	ug/L	1	B9E0550	05/28/19 12:59	05/28/19 12:59	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-04

Location ID: 603283	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Surrogate: 4-Bromofluorobenzene		99	70-130	%	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		109	70-130	%	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-04

Location ID: 603283	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Acetone		<	20	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Benzene		<	0.50	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-04

Location ID: 603283	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Styrene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Toluene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9E0506	05/28/19 16:08	05/28/19 16:08	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.11	0.050	ug/L	1	B9F0115	06/07/19 08:00	06/07/19 20:01	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9E0550	05/28/19 13:07	05/28/19 13:07	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.043	0.050	ug/L	1	B9E0550	05/28/19 13:07	05/28/19 13:07	MDH 555

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-04

Location ID: 603283	Collect Date: 05/21/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-3)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9E0550	05/28/19 13:07	05/28/19 13:07	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9E0550	05/28/19 13:07	05/28/19 13:07	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L	1	B9E0550	05/28/19 13:07	05/28/19 13:07	MDH 555
Perfluorooctanoic acid (PFOA)	J	0.025	0.035	ug/L	1	B9E0550	05/28/19 13:07	05/28/19 13:07	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.006	0.050	ug/L	1	B9E0550	05/28/19 13:07	05/28/19 13:07	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-05

Location ID: 813763	Collect Date: 05/22/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4	F5	105	70-130	%	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Surrogate: 4-Bromofluorobenzene	F5	106	70-130	%	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3	F5	106	70-130	%	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,1,1,2-Tetrachloroethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,1,1-Trichloroethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,1,2,2-Tetrachloroethane	F5	<	0.50	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,1,2-Trichloroethane	F5	<	0.50	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,1,2-Trichlorotrifluoroethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,1-Dichloroethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,1-Dichloroethene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,1-Dichloropropene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2,3-Trichlorobenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2,3-Trichloropropane	F5	<	0.20	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2,4-Trichlorobenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2,4-Trimethylbenzene	F5	21	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2-Dibromoethane (EDB)	F5	<	0.50	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2-Dichlorobenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2-Dichloroethane	F5	<	0.20	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,2-Dichloropropane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,3,5-Trimethylbenzene	F5	4.7	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,3-Dichlorobenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,3-Dichloropropane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
1,4-Dichlorobenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
2,2-Dichloropropane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
2-Chlorotoluene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-05

Location ID: 813763	Collect Date: 05/22/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Allyl chloride	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Benzene	F5	5.6	0.50	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Bromobenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Bromochloromethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Bromodichloromethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Bromoform	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Bromomethane	F5	<	2.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Carbon tetrachloride	F5	<	0.20	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Chlorobenzene	F5	1.7	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Chlorodibromomethane	F5	<	0.50	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Chloroethane	F5	2.4	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Chloroform	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Chloromethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
cis-1,2-Dichloroethene	F5	1.6	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
cis-1,3-Dichloropropene	F5	<	0.50	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Dibromomethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Dichlorodifluoromethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Dichlorofluoromethane	F5	4.3	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Ethyl ether	F5	56	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Ethylbenzene	F5	19	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Hexachlorobutadiene	F5	<	0.50	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Isopropylbenzene	F5	2.6	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Methyl tertiary butyl ether (MTBE)	F5	<	2.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Methylene chloride	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Naphthalene	F5	28	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
n-Butylbenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-05

Location ID: 813763	Collect Date: 05/22/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
n-Propylbenzene	F5	2.7	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
o-Xylene	F5	16	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
p-Isopropyltoluene	F5	15	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
sec-Butylbenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Styrene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
tert-Butylbenzene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Tetrachloroethene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Toluene	F5	18	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
trans-1,2-Dichloroethene	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
trans-1,3-Dichloropropene	F5	<	0.50	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Trichloroethene (TCE)	F5	0.25	0.10	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Trichlorofluoromethane	F5	<	1.0	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D
Vinyl chloride	F5	4.0	0.050	ug/L	1	B9E0506	05/28/19 16:36	05/28/19 16:36	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		0.055	0.025	ug/L	1	B9E0550	05/28/19 13:16	05/28/19 13:16	MDH 555
Perfluorooctanesulfonate (PFOS)	J	0.015	0.015	ug/L	1	B9E0550	05/28/19 13:16	05/28/19 13:16	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-05RE1

Location ID: 813763	Collect Date: 05/22/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4	F5	100	70-130	%	1	B9E0506	05/28/19 19:23	05/28/19 19:23	EPA 8260D
Surrogate: 4-Bromofluorobenzene	F5	102	70-130	%	1	B9E0506	05/28/19 19:23	05/28/19 19:23	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3	F5	101	70-130	%	1	B9E0506	05/28/19 19:23	05/28/19 19:23	EPA 8260D
Methyl isobutyl ketone (MIBK)	D2, F5	630	50	ug/L	1	B9E0506	05/28/19 19:23	05/28/19 19:23	EPA 8260D
p&m-Xylene	D2, F5	41	10	ug/L	1	B9E0506	05/28/19 19:23	05/28/19 19:23	EPA 8260D
Tetrahydrofuran (THF)	D2, F5	680	100	ug/L	1	B9E0506	05/28/19 19:23	05/28/19 19:23	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	220	5.1	ug/L	100	B9F0115	06/07/19 08:00	06/08/19 19:01	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	D1, J	0.14	0.25	ug/L	5	B9E0550	05/28/19 13:40	05/28/19 13:40	MDH 555
Perfluorobutanoic acid (PFBA)	D1	2.9	0.25	ug/L	5	B9E0550	05/28/19 13:40	05/28/19 13:40	MDH 555
Perfluorohexanoic acid (PFHxA)	D1	0.57	0.25	ug/L	5	B9E0550	05/28/19 13:40	05/28/19 13:40	MDH 555
Perfluorooctanoic acid (PFOA)	D1	0.87	0.18	ug/L	5	B9E0550	05/28/19 13:40	05/28/19 13:40	MDH 555
Perfluoropentanoic acid (PFPeA)	J, D1	0.13	0.25	ug/L	5	B9E0550	05/28/19 13:40	05/28/19 13:40	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

MDH Sample Number: 19E1829-05RE2

Location ID: 813763	Collect Date: 05/22/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4	F5	98	70-130	%	1	B9E0506	05/28/19 18:55	05/28/19 18:55	EPA 8260D
Surrogate: 4-Bromofluorobenzene	F5	104	70-130	%	1	B9E0506	05/28/19 18:55	05/28/19 18:55	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3	F5	102	70-130	%	1	B9E0506	05/28/19 18:55	05/28/19 18:55	EPA 8260D
Acetone	D2, F5	11000	2000	ug/L	1	B9E0506	05/28/19 18:55	05/28/19 18:55	EPA 8260D
Methyl ethyl ketone (MEK)	F5, D2	15000	1000	ug/L	1	B9E0506	05/28/19 18:55	05/28/19 18:55	EPA 8260D

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Batch Summary

Samples in Batch: B9E0506 - EPA 5030B Preparation

19E1829-01 19E1829-02 19E1829-03 19E1829-04 19E1829-05 19E1829-05RE1 19E1829-05RE2

Samples in Batch: B9E0550 - PFCs Preparation

19E1829-01 19E1829-02 19E1829-03 19E1829-04 19E1829-05 19E1829-05RE1

Samples in Batch: B9F0115 - 1,4 Dioxane in Water SPE

19E1829-01 19E1829-02 19E1829-03 19E1829-04 19E1829-05RE1

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

Blank (B9E0506-BLK1)

Prepared: 05/28/19 13:49 Analyzed: 05/28/19 13:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		104	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		108	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

Blank (B9E0506-BLK1)

Prepared: 05/28/19 13:49 Analyzed: 05/28/19 13:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane		<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

Blank (B9E0506-BLK1)

Prepared: 05/28/19 13:49 Analyzed: 05/28/19 13:49

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B9E0506-BS1)

Prepared: 05/28/19 11:30 Analyzed: 05/28/19 11:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		104	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		104	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.7	1.0	ug/L	10		97	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		105	70-130		
1,1,2,2-Tetrachloroethane		10	0.50	ug/L	10		102	70-130		
1,1,2-Trichloroethane		9.7	0.50	ug/L	10		97	70-130		
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		105	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10		106	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		100	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		107	70-130		
1,2,3-Trichlorobenzene		9.5	1.0	ug/L	10		95	70-130		
1,2,3-Trichloropropane		10	0.20	ug/L	10		103	70-130		
1,2,4-Trichlorobenzene		9.4	1.0	ug/L	10		94	70-130		
1,2,4-Trimethylbenzene		10	1.0	ug/L	10		103	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		11	1.0	ug/L	10		108	70-130		
1,2-Dibromoethane (EDB)		9.8	0.50	ug/L	10		98	70-130		
1,2-Dichlorobenzene		9.5	1.0	ug/L	10		95	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10		106	70-130		
1,2-Dichloropropane		11	1.0	ug/L	10		106	70-130		
1,3,5-Trimethylbenzene		11	1.0	ug/L	10		105	70-130		
1,3-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10		101	70-130		
1,4-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		113	70-130		
2-Chlorotoluene		11	1.0	ug/L	10		105	70-130		
4-Chlorotoluene		10	1.0	ug/L	10		104	70-130		
Acetone		110	20	ug/L	100		109	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

LCS (B9E0506-BS1)

Prepared: 05/28/19 11:30 Analyzed: 05/28/19 11:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		103	70-130		
Benzene		10	0.50	ug/L	10		104	70-130		
Bromobenzene		9.3	1.0	ug/L	10		93	70-130		
Bromochloromethane		9.8	1.0	ug/L	10		98	70-130		
Bromodichloromethane		11	1.0	ug/L	10		107	70-130		
Bromoform		9.7	1.0	ug/L	10		97	70-130		
Bromomethane		9.6	2.0	ug/L	10		96	70-130		
Carbon tetrachloride		11	0.20	ug/L	10		106	70-130		
Chlorobenzene		9.9	1.0	ug/L	10		99	70-130		
Chlorodibromomethane		9.9	0.50	ug/L	10		99	70-130		
Chloroethane		11	1.0	ug/L	10		112	70-130		
Chloroform		10	1.0	ug/L	10		104	70-130		
Chloromethane		8.8	1.0	ug/L	10		88	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		100	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10		102	70-130		
Dibromomethane		10	1.0	ug/L	10		102	70-130		
Dichlorodifluoromethane		9.0	1.0	ug/L	10		90	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130		
Ethyl ether		10	1.0	ug/L	10		101	70-130		
Ethylbenzene		10	1.0	ug/L	10		104	70-130		
Hexachlorobutadiene		9.3	0.50	ug/L	10		93	70-130		
Isopropylbenzene		10	1.0	ug/L	10		102	70-130		
Methyl ethyl ketone (MEK)		56	10	ug/L	50		112	70-130		
Methyl isobutyl ketone (MIBK)		57	5.0	ug/L	50		114	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		103	70-130		
Methylene chloride		10	1.0	ug/L	10		101	70-130		
Naphthalene		9.8	1.0	ug/L	10		98	70-130		
n-Butylbenzene		11	1.0	ug/L	10		111	70-130		
n-Propylbenzene		11	1.0	ug/L	10		111	70-130		
o-Xylene		9.9	1.0	ug/L	10		99	70-130		
p&m-Xylene		10	1.0	ug/L	10		101	70-130		
p-Isopropyltoluene		10	1.0	ug/L	10		105	70-130		
sec-Butylbenzene		11	1.0	ug/L	10		108	70-130		
Styrene		9.9	1.0	ug/L	10		99	70-130		
tert-Butylbenzene		10	1.0	ug/L	10		101	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

LCS (B9E0506-BS1)

Prepared: 05/28/19 11:30 Analyzed: 05/28/19 11:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		9.7	1.0	ug/L	10		97	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100		101	70-130		
Toluene		10	1.0	ug/L	10		103	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		101	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10		102	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		
Trichlorofluoromethane		10	1.0	ug/L	10		102	70-130		
Vinyl chloride		11	0.050	ug/L	10		108	70-130		

LCS Dup (B9E0506-BSD1)

Prepared: 05/28/19 11:58 Analyzed: 05/28/19 11:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		103	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		106	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10		102	70-130	5	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		110	70-130	5	30
1,1,2,2-Tetrachloroethane		10	0.50	ug/L	10		101	70-130	1	30
1,1,2-Trichloroethane		10	0.50	ug/L	10		100	70-130	3	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		110	70-130	4	30
1,1-Dichloroethane		11	1.0	ug/L	10		111	70-130	5	30
1,1-Dichloroethene		11	1.0	ug/L	10		106	70-130	6	30
1,1-Dichloropropene		11	1.0	ug/L	10		114	70-130	6	30
1,2,3-Trichlorobenzene		9.7	1.0	ug/L	10		97	70-130	2	30
1,2,3-Trichloropropane		10	0.20	ug/L	10		101	70-130	2	30
1,2,4-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130	2	30
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		107	70-130	3	30
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		104	70-130	4	30
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		102	70-130	3	30
1,2-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130	2	30
1,2-Dichloroethane		11	0.20	ug/L	10		110	70-130	4	30
1,2-Dichloropropane		11	1.0	ug/L	10		110	70-130	3	30
1,3,5-Trimethylbenzene		11	1.0	ug/L	10		107	70-130	2	30
1,3-Dichlorobenzene		10	1.0	ug/L	10		100	70-130	4	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

LCS Dup (B9E0506-BSD1)

Prepared: 05/28/19 11:58 Analyzed: 05/28/19 11:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		11	1.0	ug/L	10		108	70-130	6	30
1,4-Dichlorobenzene		10	1.0	ug/L	10		100	70-130	3	30
2,2-Dichloropropane		12	1.0	ug/L	10		118	70-130	4	30
2-Chlorotoluene		11	1.0	ug/L	10		106	70-130	0.9	30
4-Chlorotoluene		11	1.0	ug/L	10		108	70-130	4	30
Acetone		110	20	ug/L	100		109	70-130	0.2	30
Allyl chloride		11	1.0	ug/L	10		109	70-130	6	30
Benzene		11	0.50	ug/L	10		110	70-130	6	30
Bromobenzene		9.8	1.0	ug/L	10		98	70-130	5	30
Bromochloromethane		10	1.0	ug/L	10		104	70-130	5	30
Bromodichloromethane		11	1.0	ug/L	10		109	70-130	2	30
Bromoform		9.5	1.0	ug/L	10		95	70-130	2	30
Bromomethane		11	2.0	ug/L	10		107	70-130	10	30
Carbon tetrachloride		11	0.20	ug/L	10		110	70-130	4	30
Chlorobenzene		10	1.0	ug/L	10		104	70-130	5	30
Chlorodibromomethane		10	0.50	ug/L	10		101	70-130	2	30
Chloroethane		10	1.0	ug/L	10		103	70-130	9	30
Chloroform		11	1.0	ug/L	10		111	70-130	7	30
Chloromethane		9.4	1.0	ug/L	10		94	70-130	6	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		105	70-130	5	30
cis-1,3-Dichloropropene		11	0.50	ug/L	10		107	70-130	5	30
Dibromomethane		11	1.0	ug/L	10		106	70-130	4	30
Dichlorodifluoromethane		9.6	1.0	ug/L	10		96	70-130	6	30
Dichlorofluoromethane		11	1.0	ug/L	10		111	70-130	4	30
Ethyl ether		10	1.0	ug/L	10		102	70-130	2	30
Ethylbenzene		11	1.0	ug/L	10		109	70-130	6	30
Hexachlorobutadiene		9.5	0.50	ug/L	10		95	70-130	2	30
Isopropylbenzene		11	1.0	ug/L	10		108	70-130	6	30
Methyl ethyl ketone (MEK)		56	10	ug/L	50		112	70-130	0.3	30
Methyl isobutyl ketone (MIBK)		58	5.0	ug/L	50		116	70-130	1	30
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10		106	70-130	3	30
Methylene chloride		11	1.0	ug/L	10		106	70-130	5	30
Naphthalene		10	1.0	ug/L	10		100	70-130	2	30
n-Butylbenzene		11	1.0	ug/L	10		114	70-130	2	30
n-Propylbenzene		11	1.0	ug/L	10		114	70-130	3	30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

LCS Dup (B9E0506-BSD1)

Prepared: 05/28/19 11:58 Analyzed: 05/28/19 11:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		11	1.0	ug/L	10		108	70-130	8	30
p&m-Xylene		11	1.0	ug/L	10		108	70-130	7	30
p-Isopropyltoluene		11	1.0	ug/L	10		107	70-130	2	30
sec-Butylbenzene		11	1.0	ug/L	10		111	70-130	4	30
Styrene		11	1.0	ug/L	10		105	70-130	7	30
tert-Butylbenzene		11	1.0	ug/L	10		105	70-130	4	30
Tetrachloroethene		10	1.0	ug/L	10		100	70-130	4	30
Tetrahydrofuran (THF)		100	10	ug/L	100		100	70-130	0.6	30
Toluene		11	1.0	ug/L	10		107	70-130	4	30
trans-1,2-Dichloroethene		11	1.0	ug/L	10		107	70-130	6	30
trans-1,3-Dichloropropene		11	0.50	ug/L	10		107	70-130	5	30
Trichloroethene (TCE)		11	0.10	ug/L	10		106	70-130	5	30
Trichlorofluoromethane		11	1.0	ug/L	10		108	70-130	6	30
Vinyl chloride		11	0.050	ug/L	10		114	70-130	6	30

Duplicate (B9E0506-DUP1)

Source: 19E1829-02

Prepared: 05/28/19 15:13 Analyzed: 05/28/19 15:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		105	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		107	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

Duplicate (B9E0506-DUP1)

Source: 19E1829-02

Prepared: 05/28/19 15:13 Analyzed: 05/28/19 15:13

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		<	1.0	ug/L		<				30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		<	0.50	ug/L		<				30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane		<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		<	1.0	ug/L		<				30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		<	1.0	ug/L		<				30
cis-1,2-Dichloroethene		<	1.0	ug/L		<				30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		<	1.0	ug/L		<				30
Ethyl ether		<	1.0	ug/L		<				30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

Duplicate (B9E0506-DUP1)		Source: 19E1829-02		Prepared: 05/28/19 15:13 Analyzed: 05/28/19 15:13						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		<	10	ug/L		<				30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		<	0.10	ug/L		<				30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		<	0.050	ug/L		<				30

Matrix Spike (B9E0506-MS1)		Source: 19E1829-01		Prepared: 05/28/19 12:26 Analyzed: 05/28/19 12:26						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		105	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		107	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10	<	104	70-130		
1,1,1-Trichloroethane		12	1.0	ug/L	10	<	117	70-130		
1,1,2,2-Tetrachloroethane		11	0.50	ug/L	10	<	108	70-130		
1,1,2-Trichloroethane		10	0.50	ug/L	10	<	103	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10	<	116	70-130		
1,1-Dichloroethane		12	1.0	ug/L	10	<	118	70-130		
1,1-Dichloroethene		12	1.0	ug/L	10	<	116	70-130		
1,1-Dichloropropene		12	1.0	ug/L	10	<	122	70-130		

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

Matrix Spike (B9E0506-MS1)		Source: 19E1829-01		Prepared: 05/28/19 12:26		Analyzed: 05/28/19 12:26		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,3-Trichloropropane		11	0.20	ug/L	10	<	106	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	101	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10	<	114	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10	<	103	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	103	70-130		
1,2-Dichlorobenzene		10	1.0	ug/L	10	<	103	70-130		
1,2-Dichloroethane		11	0.20	ug/L	10	<	114	70-130		
1,2-Dichloropropane		12	1.0	ug/L	10	<	116	70-130		
1,3,5-Trimethylbenzene		11	1.0	ug/L	10	<	115	70-130		
1,3-Dichlorobenzene		11	1.0	ug/L	10	<	106	70-130		
1,3-Dichloropropane		11	1.0	ug/L	10	<	109	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
2,2-Dichloropropane		13	1.0	ug/L	10	<	126	70-130		
2-Chlorotoluene		11	1.0	ug/L	10	<	114	70-130		
4-Chlorotoluene		11	1.0	ug/L	10	<	112	70-130		
Acetone		110	20	ug/L	100	<	114	70-130		
Allyl chloride		10	1.0	ug/L	10	<	104	70-130		
Benzene		11	0.50	ug/L	10	<	115	70-130		
Bromobenzene		10	1.0	ug/L	10	<	102	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	106	70-130		
Bromodichloromethane		11	1.0	ug/L	10	<	111	70-130		
Bromoform		9.3	1.0	ug/L	10	<	93	70-130		
Bromomethane		11	2.0	ug/L	10	<	108	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	119	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	110	70-130		
Chlorodibromomethane		10	0.50	ug/L	10	<	102	70-130		
Chloroethane		13	1.0	ug/L	10	<	129	70-130		
Chloroform		12	1.0	ug/L	10	<	116	70-130		
Chloromethane		10	1.0	ug/L	10	<	104	70-130		
cis-1,2-Dichloroethene		11	1.0	ug/L	10	<	109	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10	<	100	70-130		
Dibromomethane		11	1.0	ug/L	10	<	112	70-130		
Dichlorodifluoromethane		11	1.0	ug/L	10	<	106	70-130		
Dichlorofluoromethane		12	1.0	ug/L	10	<	119	70-130		

FINAL REPORT

Report ID: 06192019 94335

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0506 - EPA 5030B Preparation

Matrix Spike (B9E0506-MS1)		Source: 19E1829-01		Prepared: 05/28/19 12:26		Analyzed: 05/28/19 12:26		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ethyl ether		11	1.0	ug/L	10	<	105	70-130		
Ethylbenzene		11	1.0	ug/L	10	<	114	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10	<	105	70-130		
Isopropylbenzene		11	1.0	ug/L	10	<	115	70-130		
Methyl ethyl ketone (MEK)		58	10	ug/L	50	<	115	70-130		
Methyl isobutyl ketone (MIBK)		60	5.0	ug/L	50	<	119	70-130		
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10	<	109	70-130		
Methylene chloride		11	1.0	ug/L	10	<	111	70-130		
Naphthalene		10	1.0	ug/L	10	<	103	70-130		
n-Butylbenzene		12	1.0	ug/L	10	<	124	70-130		
n-Propylbenzene		12	1.0	ug/L	10	<	121	70-130		
o-Xylene		11	1.0	ug/L	10	<	112	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	113	70-130		
p-Isopropyltoluene		12	1.0	ug/L	10	<	116	70-130		
sec-Butylbenzene		12	1.0	ug/L	10	<	119	70-130		
Styrene		11	1.0	ug/L	10	<	110	70-130		
tert-Butylbenzene		11	1.0	ug/L	10	<	114	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	110	70-130		
Tetrahydrofuran (THF)		100	10	ug/L	100	<	103	70-130		
Toluene		11	1.0	ug/L	10	<	114	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	113	70-130		
trans-1,3-Dichloropropene		9.8	0.50	ug/L	10	<	98	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	112	70-130		
Trichlorofluoromethane		12	1.0	ug/L	10	<	118	70-130		
Vinyl chloride		13	0.050	ug/L	10	<	126	70-130		

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0115 - 1,4 Dioxane in Water SPE

Blank (B9F0115-BLK1)				Prepared: 06/07/19 08:00 Analyzed: 06/07/19 15:52						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.049	ug/L						

LCS (B9F0115-BS1)				Prepared: 06/07/19 08:00 Analyzed: 06/07/19 16:08						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.23	0.052	ug/L	0.20		111	80-120		

Duplicate (B9F0115-DUP1)				Source: 19E1582-15 Prepared: 06/07/19 08:00 Analyzed: 06/07/19 16:42						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.051	ug/L		<				30

Matrix Spike (B9F0115-MS1)				Source: 19E1582-16 Prepared: 06/07/19 08:00 Analyzed: 06/07/19 17:15						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.52	0.052	ug/L	0.46	<	110	70-130		

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Paul Moyer, Environmental Laboratory Manager
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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0550 - PFCs Preparation

Blank (B9E0550-BLK1)

Prepared: 05/28/19 12:17 Analyzed: 05/28/19 12:17

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9E0550-BLK2)

Prepared: 05/28/19 16:02 Analyzed: 05/28/19 16:02

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9E0550-BS1)

Prepared: 05/28/19 12:09 Analyzed: 05/28/19 12:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50		102	80-120		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		102	80-120		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50		105	80-120		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5		98	80-120		
Perfluorooctanesulfonate (PFOS)		0.49	0.015	ug/L	0.49		97	80-120		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5		98	80-120		
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5		101	80-120		

LCS Dup (B9E0550-BSD1)

Prepared: 05/28/19 15:54 Analyzed: 05/28/19 15:54

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50		104	80-120	3	20
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5		100	80-120	3	20
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50		101	80-120	4	20

FINAL REPORT

Report ID: 06192019 94335

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:43

Results were produced by Minnesota Department of Health, except where noted.

Batch B9E0550 - PFCs Preparation

LCS Dup (B9E0550-BSD1)

Prepared: 05/28/19 15:54 Analyzed: 05/28/19 15:54

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5		101	80-120	3	20
Perfluorooctanesulfonate (PFOS)		0.49	0.015	ug/L	0.49		98	80-120	0.4	20
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5		101	80-120	3	20
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5		102	80-120	0.9	20

Matrix Spike (B9E0550-MS1)

Source: 19E1829-01

Prepared: 05/28/19 12:34 Analyzed: 05/28/19 12:34

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.52	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.55	0.050	ug/L	0.5	<	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130		
Perfluorohexanoic acid (PFHxA)		0.55	0.050	ug/L	0.5	<	102	70-130		
Perfluorooctanesulfonate (PFOS)		0.48	0.015	ug/L	0.49	<	95	70-130		
Perfluorooctanoic acid (PFOA)		0.65	0.035	ug/L	0.5	0.11	106	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	97	70-130		

Matrix Spike Dup (B9E0550-MSD1)

Source: 19E1829-01

Prepared: 05/28/19 12:42 Analyzed: 05/28/19 12:42

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50	<	98	70-130	4	20
Perfluorobutanoic acid (PFBA)		0.55	0.050	ug/L	0.5	<	101	70-130	0.5	20
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	99	70-130	3	20
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5	<	96	70-130	6	20
Perfluorooctanesulfonate (PFOS)		0.48	0.015	ug/L	0.49	<	96	70-130	0.8	20
Perfluorooctanoic acid (PFOA)		0.61	0.035	ug/L	0.5	0.11	100	70-130	5	20
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	101	70-130	3	20

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 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
F5	The sample pH was greater than 2. The sample was analyzed within the 7 day holding time.
D2	Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
D1	Sample required dilution due to matrix. Reporting limit has been raised.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 6/19/19

Client Name: QW - MPCA - Closed Landfill Assessment

Project Code: QW

Project Name: Closed Landfill Assessment

Work Order Number: 19E2197

Report To: QW - MPCA - Closed Landfill Assessment

Mark Umholtz

520 Lafayette Rd.

Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink that reads "Paul Moyer".

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300

<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Work Order Comment: SP-03 1,4 dioxane analysis cancelled due to lab error. -CCS 06/10/19

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
Seep 01	19E2197-01	Wtr-Surf	05/29/19 9:40	05/30/19 10:19	2.6
Discharge 01	19E2197-02	Wtr-Surf	05/29/19 10:30	05/30/19 10:19	2.6
Duplicate	19E2197-03	Wtr-Surf	05/29/19 10:40	05/30/19 10:19	2.6

Field ID	MDH Sample Number	Receiving Comments
Duplicate	19E2197-03	Lab error. -CCS

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health



Chain-of-Custody Form rev/bon 2013.0909

Work Order Number:

COC Type: Standard

Page: 1 of 1

Turnaround Time: Standard

COC ID:

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MN SW-057 Program Code (MDH Lab Only): QW
 Project Name: 19-02057 MPCA Freeway-Kraemers Mine 2019 ~~MVE~~ Project Task Code: PRJ07786
 Project Manager: Mark Umholtz 651-757-2308
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name: Minnesota Department of Health
 Address: 601 Robert Street N.
 St. Paul MN 55155
 Phone No: 651-201-5058



SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample
 QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES
 DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe
 AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES
 Wtr-Ground=Groundwater
 Wtr-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS REQUESTED			Lab Sample No.	#
												PRESERV.	VOCs EPA 8260D	PFAS by MDH555		
Seep 01	sample	5/29/19	0940			G	NW	Wtr-Surf	N		5	HCl	None	None	-01	1
Discharge 01	sample	5/29/19	1030			G	NW	Wtr-Surf	N		5	X	X	X	-02	2
Duplicate	QC-FR	5/29/19	1040			G	NW	Wtr-Surf	N		5	X	X	X	-03	3
									N							4
									N							5
									N							6
									N							7
									N							8
									N							9
									N							10

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	5/29/19 / 1300	Chris D. MDH	5/30/19 / 1019

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: **MAY 30 '19 10:19**

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # _____

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can

None Other _____ Info: _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No; Yes

Packaging & Temperature Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack #() Gel pack #() Dry ice None

Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 2.6 °C IR thermometer instrument used: A10

Samples received without evidence of freezing: Yes; No _____

Initials of person receiving parcel: U

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes; No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No; Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No; Unknown _____

All analysis have been received within the specified holding time for analysis: Yes; No Unknown _____

Rad Chem. request received: Yes; No, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Rad Chem. meter calibration date verified: Yes; No

Sample submission details are entered in the Environmental Laboratory LIMS.
Initials of person logging in the work order request into LIMS: B

Final Report
Case Narrative

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected by: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/2019 9:40

Except where noted in this report, no additional comments are needed for this Work Order.

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-01

Location ID: Seep 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Surrogate: 4-Bromofluorobenzene		103	70-130	%	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D

FINAL REPORT

Report ID: 06192019 94030

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-01

Location ID: Seep 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
4-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Acetone		<	20	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Ethyl ether		3.8	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D

FINAL REPORT

Report ID: 06192019 94030

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-01

Location ID: Seep 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Methylene chloride		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0130	06/07/19 16:15	06/07/19 16:15	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.006	0.050	ug/L	1	B9F0037	06/04/19 17:28	06/04/19 17:28	MDH 555
Perfluorobutanoic acid (PFBA)		0.25	0.050	ug/L	1	B9F0037	06/04/19 17:28	06/04/19 17:28	MDH 555
Perfluorohexanesulfonate (PFHxS)	J	0.022	0.025	ug/L	1	B9F0037	06/04/19 17:28	06/04/19 17:28	MDH 555
Perfluorohexanoic acid (PFHxA)		0.051	0.050	ug/L	1	B9F0037	06/04/19 17:28	06/04/19 17:28	MDH 555
Perfluorooctanesulfonate (PFOS)		0.037	0.015	ug/L	1	B9F0037	06/04/19 17:28	06/04/19 17:28	MDH 555

FINAL REPORT

Report ID: 06192019 94030

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-01

Location ID: Seep 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorooctanoic acid (PFOA)		0.25	0.035	ug/L	1	B9F0037	06/04/19 17:28	06/04/19 17:28	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.035	0.050	ug/L	1	B9F0037	06/04/19 17:28	06/04/19 17:28	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-01RE1

Location ID: Seep 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 9:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2, Q9	19	0.21	ug/L	4	B9F0117	06/09/19 08:00	06/10/19 22:09	EPA 522 Modified

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-02

Location ID: Discharge 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Surrogate: 4-Bromofluorobenzene		103	70-130	%	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D

FINAL REPORT

Report ID: 06192019 94030

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-02

Location ID: Discharge 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Acetone		<	20	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-02

Location ID: Discharge 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0130	06/07/19 16:43	06/07/19 16:43	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	Q9	1.5	0.051	ug/L	1	B9F0117	06/09/19 08:00	06/09/19 20:39	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.006	0.050	ug/L	1	B9F0037	06/04/19 17:36	06/04/19 17:36	MDH 555
Perfluorobutanoic acid (PFBA)		0.080	0.050	ug/L	1	B9F0037	06/04/19 17:36	06/04/19 17:36	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-02

Location ID: Discharge 01	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)	J	0.004	0.025	ug/L	1	B9F0037	06/04/19 17:36	06/04/19 17:36	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.018	0.050	ug/L	1	B9F0037	06/04/19 17:36	06/04/19 17:36	MDH 555
Perfluorooctanesulfonate (PFOS)		0.034	0.015	ug/L	1	B9F0037	06/04/19 17:36	06/04/19 17:36	MDH 555
Perfluorooctanoic acid (PFOA)		0.066	0.035	ug/L	1	B9F0037	06/04/19 17:36	06/04/19 17:36	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.013	0.050	ug/L	1	B9F0037	06/04/19 17:36	06/04/19 17:36	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-03

Location ID: Duplicate	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Receiving Comments: Lab error. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Surrogate: 4-Bromofluorobenzene		100	70-130	%	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		97	70-130	%	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-03

Location ID: Duplicate	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Receiving Comments: Lab error. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Acetone		<	20	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-03

Location ID: Duplicate	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: Field Dup/Rep		Field PO ₄ Result: None

Receiving Comments: Lab error. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0130	06/07/19 17:11	06/07/19 17:11	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9F0037	06/04/19 17:45	06/04/19 17:45	MDH 555
Perfluorobutanoic acid (PFBA)		0.079	0.050	ug/L	1	B9F0037	06/04/19 17:45	06/04/19 17:45	MDH 555
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9F0037	06/04/19 17:45	06/04/19 17:45	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.019	0.050	ug/L	1	B9F0037	06/04/19 17:45	06/04/19 17:45	MDH 555
Perfluorooctanesulfonate (PFOS)		0.029	0.015	ug/L	1	B9F0037	06/04/19 17:45	06/04/19 17:45	MDH 555
Perfluorooctanoic acid (PFOA)		0.059	0.035	ug/L	1	B9F0037	06/04/19 17:45	06/04/19 17:45	MDH 555

FINAL REPORT

Report ID: 06192019 94030

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

MDH Sample Number: 19E2197-03

Location ID: Duplicate	Collect Date: 05/29/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:40	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Surf	Field pH Result: None
QA Type: Field Dup/Rep		Field PO ₄ Result: None

Receiving Comments: Lab error. -CCS

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluoropentanoic acid (PFPeA)	J	0.012	0.050	ug/L	1	B9F0037	06/04/19 17:45	06/04/19 17:45	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Batch Summary

Samples in Batch: B9F0037 - PFCs Preparation

19E2197-01 19E2197-02 19E2197-03

Samples in Batch: B9F0117 - 1,4 Dioxane in Water SPE

19E2197-01RE1 19E2197-02

Samples in Batch: B9F0130 - EPA 5030B Preparation

19E2197-01 19E2197-02 19E2197-03

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		103	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane		<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		101	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.8	1.0	ug/L	10		98	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		100	70-130		
1,1,2,2-Tetrachloroethane		9.7	0.50	ug/L	10		97	70-130		
1,1,2-Trichloroethane		9.5	0.50	ug/L	10		95	70-130		
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		105	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		100	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		102	70-130		
1,1-Dichloropropene		10	1.0	ug/L	10		103	70-130		
1,2,3-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130		
1,2,4-Trichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		107	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		101	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		101	70-130		
1,2-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2-Dichloroethane		9.2	0.20	ug/L	10		92	70-130		
1,2-Dichloropropane		9.6	1.0	ug/L	10		96	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		105	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10		100	70-130		
1,3-Dichloropropane		9.7	1.0	ug/L	10		97	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10		101	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		107	70-130		
2-Chlorotoluene		10	1.0	ug/L	10		104	70-130		
4-Chlorotoluene		10	1.0	ug/L	10		102	70-130		
Acetone		100	20	ug/L	100		104	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		100	70-130		
Benzene		10	0.50	ug/L	10		100	70-130		
Bromobenzene		9.6	1.0	ug/L	10		96	70-130		
Bromochloromethane		9.9	1.0	ug/L	10		99	70-130		
Bromodichloromethane		9.8	1.0	ug/L	10		98	70-130		
Bromoform		11	1.0	ug/L	10		108	70-130		
Bromomethane		9.2	2.0	ug/L	10		92	70-130		
Carbon tetrachloride		10	0.20	ug/L	10		101	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		10	0.50	ug/L	10		103	70-130		
Chloroethane		9.9	1.0	ug/L	10		99	70-130		
Chloroform		10	1.0	ug/L	10		100	70-130		
Chloromethane		9.2	1.0	ug/L	10		92	70-130		
cis-1,2-Dichloroethene		9.8	1.0	ug/L	10		98	70-130		
cis-1,3-Dichloropropene		9.7	0.50	ug/L	10		97	70-130		
Dibromomethane		9.4	1.0	ug/L	10		94	70-130		
Dichlorodifluoromethane		9.8	1.0	ug/L	10		98	70-130		
Dichlorofluoromethane		10	1.0	ug/L	10		100	70-130		
Ethyl ether		9.6	1.0	ug/L	10		96	70-130		
Ethylbenzene		10	1.0	ug/L	10		102	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10		107	70-130		
Isopropylbenzene		11	1.0	ug/L	10		107	70-130		
Methyl ethyl ketone (MEK)		52	10	ug/L	50		105	70-130		
Methyl isobutyl ketone (MIBK)		54	5.0	ug/L	50		108	70-130		
Methyl tertiary butyl ether (MTBE)		9.6	2.0	ug/L	10		96	70-130		
Methylene chloride		9.6	1.0	ug/L	10		96	70-130		
Naphthalene		10	1.0	ug/L	10		100	70-130		
n-Butylbenzene		11	1.0	ug/L	10		105	70-130		
n-Propylbenzene		10	1.0	ug/L	10		105	70-130		
o-Xylene		10	1.0	ug/L	10		103	70-130		
p&m-Xylene		11	1.0	ug/L	10		106	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10		106	70-130		
sec-Butylbenzene		11	1.0	ug/L	10		106	70-130		
Styrene		10	1.0	ug/L	10		104	70-130		
tert-Butylbenzene		11	1.0	ug/L	10		106	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		101	70-130		
Tetrahydrofuran (THF)		96	10	ug/L	100		96	70-130		
Toluene		10	1.0	ug/L	10		102	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		
Trichlorofluoromethane		10	1.0	ug/L	10		102	70-130		
Vinyl chloride		9.4	0.050	ug/L	10		94	70-130		

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130	0.7	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	6	30
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130	3	30
1,1,2-Trichloroethane		9.6	0.50	ug/L	10		96	70-130	0.8	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		108	70-130	3	30
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130	4	30
1,1-Dichloroethene		11	1.0	ug/L	10		109	70-130	6	30
1,1-Dichloropropene		11	1.0	ug/L	10		108	70-130	4	30
1,2,3-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130	2	30
1,2,3-Trichloropropane		9.3	0.20	ug/L	10		93	70-130	3	30
1,2,4-Trichlorobenzene		10	1.0	ug/L	10		101	70-130	2	30
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		109	70-130	2	30
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		101	70-130	0.2	30
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		100	70-130	1	30
1,2-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130	0.5	30
1,2-Dichloroethane		9.3	0.20	ug/L	10		93	70-130	2	30
1,2-Dichloropropane		9.9	1.0	ug/L	10		99	70-130	2	30
1,3,5-Trimethylbenzene		11	1.0	ug/L	10		106	70-130	1	30
1,3-Dichlorobenzene		10	1.0	ug/L	10		101	70-130	1	30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		9.7	1.0	ug/L	10		97	70-130	0.4	30
1,4-Dichlorobenzene		10	1.0	ug/L	10		100	70-130	0.5	30
2,2-Dichloropropane		11	1.0	ug/L	10		111	70-130	4	30
2-Chlorotoluene		10	1.0	ug/L	10		105	70-130	1	30
4-Chlorotoluene		10	1.0	ug/L	10		104	70-130	1	30
Acetone		100	20	ug/L	100		103	70-130	0.5	30
Allyl chloride		10	1.0	ug/L	10		102	70-130	2	30
Benzene		10	0.50	ug/L	10		104	70-130	5	30
Bromobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
Bromochloromethane		10	1.0	ug/L	10		103	70-130	4	30
Bromodichloromethane		10	1.0	ug/L	10		101	70-130	2	30
Bromoform		11	1.0	ug/L	10		106	70-130	1	30
Bromomethane		10	2.0	ug/L	10		102	70-130	10	30
Carbon tetrachloride		11	0.20	ug/L	10		107	70-130	5	30
Chlorobenzene		10	1.0	ug/L	10		101	70-130	0.7	30
Chlorodibromomethane		10	0.50	ug/L	10		101	70-130	2	30
Chloroethane		10	1.0	ug/L	10		104	70-130	5	30
Chloroform		10	1.0	ug/L	10		103	70-130	2	30
Chloromethane		9.6	1.0	ug/L	10		96	70-130	5	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130	4	30
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130	3	30
Dibromomethane		9.5	1.0	ug/L	10		95	70-130	1	30
Dichlorodifluoromethane		10	1.0	ug/L	10		105	70-130	6	30
Dichlorofluoromethane		11	1.0	ug/L	10		106	70-130	6	30
Ethyl ether		10	1.0	ug/L	10		100	70-130	4	30
Ethylbenzene		10	1.0	ug/L	10		104	70-130	2	30
Hexachlorobutadiene		11	0.50	ug/L	10		110	70-130	3	30
Isopropylbenzene		11	1.0	ug/L	10		109	70-130	2	30
Methyl ethyl ketone (MEK)		52	10	ug/L	50		104	70-130	1	30
Methyl isobutyl ketone (MIBK)		53	5.0	ug/L	50		106	70-130	2	30
Methyl tertiary butyl ether (MTBE)		9.8	2.0	ug/L	10		98	70-130	2	30
Methylene chloride		9.7	1.0	ug/L	10		97	70-130	1	30
Naphthalene		10	1.0	ug/L	10		100	70-130	0.2	30
n-Butylbenzene		11	1.0	ug/L	10		107	70-130	1	30
n-Propylbenzene		11	1.0	ug/L	10		109	70-130	4	30

FINAL REPORT

Report ID: 06192019 94030

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		10	1.0	ug/L	10		104	70-130	0.8	30
p&m-Xylene		11	1.0	ug/L	10		107	70-130	2	30
p-Isopropyltoluene		11	1.0	ug/L	10		110	70-130	4	30
sec-Butylbenzene		11	1.0	ug/L	10		109	70-130	3	30
Styrene		11	1.0	ug/L	10		106	70-130	2	30
tert-Butylbenzene		11	1.0	ug/L	10		108	70-130	2	30
Tetrachloroethene		10	1.0	ug/L	10		103	70-130	1	30
Tetrahydrofuran (THF)		97	10	ug/L	100		97	70-130	0.6	30
Toluene		11	1.0	ug/L	10		106	70-130	4	30
trans-1,2-Dichloroethene		11	1.0	ug/L	10		106	70-130	4	30
trans-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130	2	30
Trichloroethene (TCE)		11	0.10	ug/L	10		105	70-130	4	30
Trichlorofluoromethane		11	1.0	ug/L	10		107	70-130	6	30
Vinyl chloride		10	0.050	ug/L	10		100	70-130	6	30

Duplicate (B9F0130-DUP1)

Source: 19E2198-03

Prepared: 06/07/19 15:47 Analyzed: 06/07/19 15:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		103	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Duplicate (B9F0130-DUP1)

Source: 19E2198-03

Prepared: 06/07/19 15:47 Analyzed: 06/07/19 15:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		0.29	1.0	ug/L		<			7	30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		0.11	0.50	ug/L		<			0	30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane		<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		<	1.0	ug/L		<				30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		<	1.0	ug/L		<				30
cis-1,2-Dichloroethene		<	1.0	ug/L		<				30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		<	1.0	ug/L		<				30
Ethyl ether		<	1.0	ug/L		<				30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Duplicate (B9F0130-DUP1)		Source: 19E2198-03		Prepared: 06/07/19 15:47 Analyzed: 06/07/19 15:47						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		<	10	ug/L		<				30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		0.060	0.10	ug/L		<			15	30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		<	0.050	ug/L		<				30

Matrix Spike (B9F0130-MS1)		Source: 19E2198-02		Prepared: 06/07/19 12:05 Analyzed: 06/07/19 12:05						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10	<	100	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	108	70-130		
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10	<	95	70-130		
1,1,2-Trichloroethane		9.6	0.50	ug/L	10	<	96	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10	<	115	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	105	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	109	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10	<	110	70-130		

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Matrix Spike (B9F0130-MS1)		Source: 19E2198-02		Prepared: 06/07/19 12:05		Analyzed: 06/07/19 12:05		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2,3-Trichloropropane		9.1	0.20	ug/L	10	<	91	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10	<	110	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.7	1.0	ug/L	10	<	97	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	101	70-130		
1,2-Dichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2-Dichloroethane		9.4	0.20	ug/L	10	<	94	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10	<	100	70-130		
1,3,5-Trimethylbenzene		11	1.0	ug/L	10	<	109	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichloropropane		9.7	1.0	ug/L	10	<	97	70-130		
1,4-Dichlorobenzene		11	1.0	ug/L	10	<	104	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	116	70-130		
2-Chlorotoluene		11	1.0	ug/L	10	<	107	70-130		
4-Chlorotoluene		11	1.0	ug/L	10	<	107	70-130		
Acetone		98	20	ug/L	100	<	98	70-130		
Allyl chloride		10	1.0	ug/L	10	<	101	70-130		
Benzene		11	0.50	ug/L	10	<	107	70-130		
Bromobenzene		9.9	1.0	ug/L	10	<	99	70-130		
Bromochloromethane		10	1.0	ug/L	10	<	102	70-130		
Bromodichloromethane		10	1.0	ug/L	10	<	101	70-130		
Bromoform		10	1.0	ug/L	10	<	100	70-130		
Bromomethane		10	2.0	ug/L	10	<	105	70-130		
Carbon tetrachloride		11	0.20	ug/L	10	<	109	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	104	70-130		
Chlorodibromomethane		10	0.50	ug/L	10	<	100	70-130		
Chloroethane		11	1.0	ug/L	10	<	108	70-130		
Chloroform		10	1.0	ug/L	10	<	104	70-130		
Chloromethane		9.9	1.0	ug/L	10	<	99	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10	<	104	70-130		
cis-1,3-Dichloropropene		9.8	0.50	ug/L	10	<	98	70-130		
Dibromomethane		9.5	1.0	ug/L	10	<	95	70-130		
Dichlorodifluoromethane		11	1.0	ug/L	10	<	109	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10	<	110	70-130		

FINAL REPORT

Report ID: 06192019 94030

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Analyte	Analyte Qualifier(s)	Source: 19E2198-02		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
		Result	Reporting Limit							
Ethyl ether		10	1.0	ug/L	10	<	101	70-130		
Ethylbenzene		11	1.0	ug/L	10	<	108	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10	<	115	70-130		
Isopropylbenzene		12	1.0	ug/L	10	<	115	70-130		
Methyl ethyl ketone (MEK)		50	10	ug/L	50	<	100	70-130		
Methyl isobutyl ketone (MIBK)		53	5.0	ug/L	50	<	107	70-130		
Methyl tertiary butyl ether (MTBE)		9.7	2.0	ug/L	10	<	97	70-130		
Methylene chloride		10	1.0	ug/L	10	<	101	70-130		
Naphthalene		10	1.0	ug/L	10	<	102	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	112	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	110	70-130		
o-Xylene		11	1.0	ug/L	10	<	109	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	114	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10	<	114	70-130		
sec-Butylbenzene		12	1.0	ug/L	10	<	116	70-130		
Styrene		11	1.0	ug/L	10	<	109	70-130		
tert-Butylbenzene		11	1.0	ug/L	10	<	112	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	110	70-130		
Tetrahydrofuran (THF)		91	10	ug/L	100	<	91	70-130		
Toluene		11	1.0	ug/L	10	<	109	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	106	70-130		
trans-1,3-Dichloropropene		9.7	0.50	ug/L	10	<	97	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	108	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10	<	111	70-130		
Vinyl chloride		10	0.050	ug/L	10	<	104	70-130		

FINAL REPORT

Report ID: 06192019 94030

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0117 - 1,4 Dioxane in Water SPE

Blank (B9F0117-BLK1)

Prepared: 06/09/19 08:00 Analyzed: 06/09/19 14:52

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	Q9	<	0.050	ug/L						

LCS (B9F0117-BS1)

Prepared: 06/09/19 08:00 Analyzed: 06/09/19 15:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	Q9	0.22	0.052	ug/L	0.20		105	80-120		

LCS Dup (B9F0117-BSD1)

Prepared: 06/09/19 08:00 Analyzed: 06/09/19 15:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	Q9	0.23	0.051	ug/L	0.20		112	80-120	6	20

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0037 - PFCs Preparation

Blank (B9F0037-BLK1)

Prepared: 06/04/19 15:40 Analyzed: 06/04/19 15:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9F0037-BLK2)

Prepared: 06/04/19 19:08 Analyzed: 06/04/19 19:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9F0037-BS1)

Prepared: 06/04/19 15:31 Analyzed: 06/04/19 15:31

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50		110	80-120		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		101	80-120		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50		106	80-120		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5		99	80-120		
Perfluorooctanesulfonate (PFOS)		0.50	0.015	ug/L	0.49		99	80-120		
Perfluorooctanoic acid (PFOA)		0.48	0.035	ug/L	0.5		96	80-120		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5		101	80-120		

LCS Dup (B9F0037-BSD1)

Prepared: 06/04/19 18:59 Analyzed: 06/04/19 18:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		100	80-120	9	20
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		101	80-120	0.1	20
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50		105	80-120	1	20

FINAL REPORT

Report ID: 06192019 94030

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-02057 MPCA Freeway-Kraemers Mine 2019 MDH
Collector ID: None	Generated: 06/19/19 9:40

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0037 - PFCs Preparation

LCS Dup (B9F0037-BSD1)

Prepared: 06/04/19 18:59 Analyzed: 06/04/19 18:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5		108	80-120	9	20
Perfluorooctanesulfonate (PFOS)		0.52	0.015	ug/L	0.49		104	80-120	5	20
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5		100	80-120	3	20
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		104	80-120	2	20

Matrix Spike (B9F0037-MS1)

Source: 19E2061-07

Prepared: 06/04/19 15:56 Analyzed: 06/04/19 15:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	108	70-130		
Perfluorobutanoic acid (PFBA)		1.4	0.050	ug/L	0.5	0.82	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.015	ug/L	0.49	<	105	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike Dup (B9F0037-MSD1)

Source: 19E2061-07

Prepared: 06/04/19 16:05 Analyzed: 06/04/19 16:05

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130	6	20
Perfluorobutanoic acid (PFBA)		1.3	0.050	ug/L	0.5	0.82	101	70-130	2	20
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130	4	20
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	100	70-130	3	20
Perfluorooctanesulfonate (PFOS)		0.50	0.015	ug/L	0.49	<	101	70-130	4	20
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	103	70-130	5	20
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	101	70-130	0.8	20

FINAL REPORT

Report ID: 06192019 94030

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

Q9	Insufficient sample received to meet method quality control requirements.
J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
D2	Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 6/19/19
Client Name: QW - MPCA - Closed Landfill Assessment
Project Code: QW
Project Name: Closed Landfill Assessment

Work Order Number: 19E2198

Report To: QW - MPCA - Closed Landfill Assessment
Mark Umholtz
520 Lafayette Rd.
Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Moyer", is written over a light gray rectangular background.

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300
<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Work Order Comment: Samples were received in proper condition unless otherwise specified in the receiving comments.

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
Trip Blank 5	19E2198-01	QC-BLANK	05/28/19 8:00	05/30/19 10:19	4.1
834657	19E2198-02	Wtr-Ground	05/28/19 10:00	05/30/19 10:19	4.1
834656	19E2198-03	Wtr-Ground	05/28/19 12:00	05/30/19 10:19	4.1
834655	19E2198-04	Wtr-Ground	05/28/19 14:00	05/30/19 10:19	4.1

Field ID	MDH Sample Number	Receiving Comments
834657	19E2198-02	(MW-13)
834656	19E2198-03	(MW-12)
834655	19E2198-04	(MW-11)

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health



Chain-of-Custody Form revision 2013.0999

Work Order Number: _____ COC Type: Standard

Turnaround Time: Standard COC ID: _____

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MN SW-057 Program Code (MDH Lab Only): **QW**
 Project Name: 19-01567 MPCA Freeway Landfill 2019 MDH Project Task Code: PRJ07786
 Project Manager: Mark Umholtz 651-757-2308

Lab Name: Minnesota Department of Health
 Address: 601 Robert Street N.
 St. Paul MN 55155
 Phone No: 651-201-5058



19E2198

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
 S-IVP-Integrated Vertical Profile Sample
 S-CWOP-Composite Sample

QC-FB-Field Blank Sample
 QC-FR-Field Replicate Sample
 QC-TB-Trip Blank Sample

LAB MATRIX CODES

DW-Drinking Water
 NW-Non-potable Water
 SD-Soil/Solid
 WP-Wipe

AR-Air
 BL-Biological Material
 OT-Other
 TS-Tissue

FIELD MATRIX CODES

Wtr-Ground-Groundwater
 Wtr-Surf-Surface Water
 QC-BLANK-Artificial Blank Water
 Leachate-Leachate Sample

PRESERV.

HCl
 None
 None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	ANALYSIS REQUESTED			Lab Sample No.	#
													VOCs EPA 8260D	PFAS by MDH555	1,4 Dioxane		
Trip Blank	QC-TB	5/28/19	0800			G	NW	QC-BLANK	N		3	X			-01	1	
834657	Sample	5/28/19	1000			G	NW	Wtr-Ground	N	(m.w-13)	5	X	X	X	-02	2	
834656	Sample	5/28/19	1200			G	NW	Wtr-Ground	N	(m.w-12)	5	X	X	X	-03	3	
834655	Sample	5/28/19	1400			G	NW	Wtr-Ground	N	(m.w-11)	5	X	X	X	-04	4	
									N							5	
									N							6	
									N							7	
									N							8	
									N							9	
									N							10	

~~DATA 5/29/19~~

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #: _____

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
David Anderson / Pace Analytical	5/29/19 / 1300	[Signature] MDH	5-30-19 1019

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: **MAY 30 '19 10:19**

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # _____

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can

None Other _____ Info: _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No; Yes

Packaging & Temperature Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack # (A) Gel pack # () Dry ice None

Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 4.1 °C IR thermometer instrument used: B10

Samples received without evidence of freezing: Yes; No _____

Initials of person receiving parcel: MS

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes; No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No; Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No; Unknown

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Rad Chem. request received: Yes; No, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Rad Chem. meter calibration date verified: Yes; No

Sample submission details are entered in the Environmental Laboratory LIMS.
Initials of person logging in the work order request into LIMS: MS

Final Report
Case Narrative

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected by: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/2019 9:36

Except where noted in this report, no additional comments are needed for this Work Order.

FINAL REPORT

Report ID: 06192019 93716

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-01

Location ID: Trip Blank 5	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 8:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Surrogate: 4-Bromofluorobenzene		104	70-130	%	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D

FINAL REPORT

Report ID: 06192019 93716

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-01

Location ID: Trip Blank 5	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 8:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
4-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Acetone		<	20	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D

FINAL REPORT

Report ID: 06192019 93716

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-01

Location ID: Trip Blank 5	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 8:00	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Trip Blank		Field PO ₄ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Methylene chloride		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0130	06/07/19 13:56	06/07/19 13:56	EPA 8260D

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-02

Location ID: 834657	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-13)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Surrogate: 4-Bromofluorobenzene		101	70-130	%	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-02

Location ID: 834657	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-13)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Acetone		<	20	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-02

Location ID: 834657	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-13)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0130	06/07/19 14:52	06/07/19 14:52	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	Q9	<	0.051	ug/L	1	B9F0117	06/09/19 08:00	06/09/19 20:55	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9F0037	06/04/19 17:53	06/04/19 17:53	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.011	0.050	ug/L	1	B9F0037	06/04/19 17:53	06/04/19 17:53	MDH 555

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-02

Location ID: 834657	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-13)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)	J	0.005	0.025	ug/L	1	B9F0037	06/04/19 17:53	06/04/19 17:53	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9F0037	06/04/19 17:53	06/04/19 17:53	MDH 555
Perfluorooctanesulfonate (PFOS)		0.10	0.015	ug/L	1	B9F0037	06/04/19 17:53	06/04/19 17:53	MDH 555
Perfluorooctanoic acid (PFOA)		0.052	0.035	ug/L	1	B9F0037	06/04/19 17:53	06/04/19 17:53	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9F0037	06/04/19 17:53	06/04/19 17:53	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-03

Location ID: 834656	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-12)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Surrogate: 4-Bromofluorobenzene		101	70-130	%	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		101	70-130	%	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D

FINAL REPORT

Report ID: 06192019 93716

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-03

Location ID: 834656	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-12)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Acetone		<	20	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-03

Location ID: 834656	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: (MW-12)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0130	06/07/19 15:19	06/07/19 15:19	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	Q9	<	0.053	ug/L	1	B9F0117	06/09/19 08:00	06/09/19 21:12	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9F0037	06/04/19 18:01	06/04/19 18:01	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.023	0.050	ug/L	1	B9F0037	06/04/19 18:01	06/04/19 18:01	MDH 555

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-03

Location ID: 834656	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-12)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)	J	0.010	0.025	ug/L	1	B9F0037	06/04/19 18:01	06/04/19 18:01	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9F0037	06/04/19 18:01	06/04/19 18:01	MDH 555
Perfluorooctanesulfonate (PFOS)		0.056	0.015	ug/L	1	B9F0037	06/04/19 18:01	06/04/19 18:01	MDH 555
Perfluorooctanoic acid (PFOA)		0.10	0.035	ug/L	1	B9F0037	06/04/19 18:01	06/04/19 18:01	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9F0037	06/04/19 18:01	06/04/19 18:01	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-04

Location ID: 834655	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: (MW-11)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Surrogate: 4-Bromofluorobenzene		104	70-130	%	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		97	70-130	%	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
1,4-Dichlorobenzene		1.0	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D

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 Public Health Laboratory, Minnesota Department of Health

Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-04

Location ID: 834655	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-11)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Acetone		<	20	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Chlorobenzene		1.5	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Ethyl ether		2.9	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-04

Location ID: 834655	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: (MW-11)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D
Vinyl chloride		0.050	0.050	ug/L	1	B9F0130	06/07/19 17:39	06/07/19 17:39	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.80	0.050	ug/L	1	B9F0163	06/10/19 08:00	06/10/19 15:32	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9F0037	06/04/19 18:10	06/04/19 18:10	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.017	0.050	ug/L	1	B9F0037	06/04/19 18:10	06/04/19 18:10	MDH 555

FINAL REPORT

Report ID: 06192019 93716

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

MDH Sample Number: 19E2198-04

Location ID: 834655	Collect Date: 05/28/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 14:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-11)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)	J	0.015	0.025	ug/L	1	B9F0037	06/04/19 18:10	06/04/19 18:10	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.015	0.050	ug/L	1	B9F0037	06/04/19 18:10	06/04/19 18:10	MDH 555
Perfluorooctanesulfonate (PFOS)		0.078	0.015	ug/L	1	B9F0037	06/04/19 18:10	06/04/19 18:10	MDH 555
Perfluorooctanoic acid (PFOA)		0.14	0.035	ug/L	1	B9F0037	06/04/19 18:10	06/04/19 18:10	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.006	0.050	ug/L	1	B9F0037	06/04/19 18:10	06/04/19 18:10	MDH 555

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Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Batch Summary

Samples in Batch: B9F0037 - PFCs Preparation

19E2198-02 19E2198-03 19E2198-04

Samples in Batch: B9F0117 - 1,4 Dioxane in Water SPE

19E2198-02 19E2198-03

Samples in Batch: B9F0130 - EPA 5030B Preparation

19E2198-01 19E2198-02 19E2198-03 19E2198-04

Samples in Batch: B9F0163 - 1,4 Dioxane in Water SPE

19E2198-04

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		103	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane		<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		101	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.8	1.0	ug/L	10		98	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		100	70-130		
1,1,2,2-Tetrachloroethane		9.7	0.50	ug/L	10		97	70-130		
1,1,2-Trichloroethane		9.5	0.50	ug/L	10		95	70-130		
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		105	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		100	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		102	70-130		
1,1-Dichloropropene		10	1.0	ug/L	10		103	70-130		
1,2,3-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130		
1,2,4-Trichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		107	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		101	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		101	70-130		
1,2-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2-Dichloroethane		9.2	0.20	ug/L	10		92	70-130		
1,2-Dichloropropane		9.6	1.0	ug/L	10		96	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		105	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10		100	70-130		
1,3-Dichloropropane		9.7	1.0	ug/L	10		97	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10		101	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		107	70-130		
2-Chlorotoluene		10	1.0	ug/L	10		104	70-130		
4-Chlorotoluene		10	1.0	ug/L	10		102	70-130		
Acetone		100	20	ug/L	100		104	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		100	70-130		
Benzene		10	0.50	ug/L	10		100	70-130		
Bromobenzene		9.6	1.0	ug/L	10		96	70-130		
Bromochloromethane		9.9	1.0	ug/L	10		99	70-130		
Bromodichloromethane		9.8	1.0	ug/L	10		98	70-130		
Bromoform		11	1.0	ug/L	10		108	70-130		
Bromomethane		9.2	2.0	ug/L	10		92	70-130		
Carbon tetrachloride		10	0.20	ug/L	10		101	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		10	0.50	ug/L	10		103	70-130		
Chloroethane		9.9	1.0	ug/L	10		99	70-130		
Chloroform		10	1.0	ug/L	10		100	70-130		
Chloromethane		9.2	1.0	ug/L	10		92	70-130		
cis-1,2-Dichloroethene		9.8	1.0	ug/L	10		98	70-130		
cis-1,3-Dichloropropene		9.7	0.50	ug/L	10		97	70-130		
Dibromomethane		9.4	1.0	ug/L	10		94	70-130		
Dichlorodifluoromethane		9.8	1.0	ug/L	10		98	70-130		
Dichlorofluoromethane		10	1.0	ug/L	10		100	70-130		
Ethyl ether		9.6	1.0	ug/L	10		96	70-130		
Ethylbenzene		10	1.0	ug/L	10		102	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10		107	70-130		
Isopropylbenzene		11	1.0	ug/L	10		107	70-130		
Methyl ethyl ketone (MEK)		52	10	ug/L	50		105	70-130		
Methyl isobutyl ketone (MIBK)		54	5.0	ug/L	50		108	70-130		
Methyl tertiary butyl ether (MTBE)		9.6	2.0	ug/L	10		96	70-130		
Methylene chloride		9.6	1.0	ug/L	10		96	70-130		
Naphthalene		10	1.0	ug/L	10		100	70-130		
n-Butylbenzene		11	1.0	ug/L	10		105	70-130		
n-Propylbenzene		10	1.0	ug/L	10		105	70-130		
o-Xylene		10	1.0	ug/L	10		103	70-130		
p&m-Xylene		11	1.0	ug/L	10		106	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10		106	70-130		
sec-Butylbenzene		11	1.0	ug/L	10		106	70-130		
Styrene		10	1.0	ug/L	10		104	70-130		
tert-Butylbenzene		11	1.0	ug/L	10		106	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		101	70-130		
Tetrahydrofuran (THF)		96	10	ug/L	100		96	70-130		
Toluene		10	1.0	ug/L	10		102	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		
Trichlorofluoromethane		10	1.0	ug/L	10		102	70-130		
Vinyl chloride		9.4	0.050	ug/L	10		94	70-130		

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130	0.7	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	6	30
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130	3	30
1,1,2-Trichloroethane		9.6	0.50	ug/L	10		96	70-130	0.8	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		108	70-130	3	30
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130	4	30
1,1-Dichloroethene		11	1.0	ug/L	10		109	70-130	6	30
1,1-Dichloropropene		11	1.0	ug/L	10		108	70-130	4	30
1,2,3-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130	2	30
1,2,3-Trichloropropane		9.3	0.20	ug/L	10		93	70-130	3	30
1,2,4-Trichlorobenzene		10	1.0	ug/L	10		101	70-130	2	30
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		109	70-130	2	30
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		101	70-130	0.2	30
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		100	70-130	1	30
1,2-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130	0.5	30
1,2-Dichloroethane		9.3	0.20	ug/L	10		93	70-130	2	30
1,2-Dichloropropane		9.9	1.0	ug/L	10		99	70-130	2	30
1,3,5-Trimethylbenzene		11	1.0	ug/L	10		106	70-130	1	30
1,3-Dichlorobenzene		10	1.0	ug/L	10		101	70-130	1	30

FINAL REPORT

Report ID: 06192019 93716

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		9.7	1.0	ug/L	10		97	70-130	0.4	30
1,4-Dichlorobenzene		10	1.0	ug/L	10		100	70-130	0.5	30
2,2-Dichloropropane		11	1.0	ug/L	10		111	70-130	4	30
2-Chlorotoluene		10	1.0	ug/L	10		105	70-130	1	30
4-Chlorotoluene		10	1.0	ug/L	10		104	70-130	1	30
Acetone		100	20	ug/L	100		103	70-130	0.5	30
Allyl chloride		10	1.0	ug/L	10		102	70-130	2	30
Benzene		10	0.50	ug/L	10		104	70-130	5	30
Bromobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
Bromochloromethane		10	1.0	ug/L	10		103	70-130	4	30
Bromodichloromethane		10	1.0	ug/L	10		101	70-130	2	30
Bromoform		11	1.0	ug/L	10		106	70-130	1	30
Bromomethane		10	2.0	ug/L	10		102	70-130	10	30
Carbon tetrachloride		11	0.20	ug/L	10		107	70-130	5	30
Chlorobenzene		10	1.0	ug/L	10		101	70-130	0.7	30
Chlorodibromomethane		10	0.50	ug/L	10		101	70-130	2	30
Chloroethane		10	1.0	ug/L	10		104	70-130	5	30
Chloroform		10	1.0	ug/L	10		103	70-130	2	30
Chloromethane		9.6	1.0	ug/L	10		96	70-130	5	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130	4	30
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130	3	30
Dibromomethane		9.5	1.0	ug/L	10		95	70-130	1	30
Dichlorodifluoromethane		10	1.0	ug/L	10		105	70-130	6	30
Dichlorofluoromethane		11	1.0	ug/L	10		106	70-130	6	30
Ethyl ether		10	1.0	ug/L	10		100	70-130	4	30
Ethylbenzene		10	1.0	ug/L	10		104	70-130	2	30
Hexachlorobutadiene		11	0.50	ug/L	10		110	70-130	3	30
Isopropylbenzene		11	1.0	ug/L	10		109	70-130	2	30
Methyl ethyl ketone (MEK)		52	10	ug/L	50		104	70-130	1	30
Methyl isobutyl ketone (MIBK)		53	5.0	ug/L	50		106	70-130	2	30
Methyl tertiary butyl ether (MTBE)		9.8	2.0	ug/L	10		98	70-130	2	30
Methylene chloride		9.7	1.0	ug/L	10		97	70-130	1	30
Naphthalene		10	1.0	ug/L	10		100	70-130	0.2	30
n-Butylbenzene		11	1.0	ug/L	10		107	70-130	1	30
n-Propylbenzene		11	1.0	ug/L	10		109	70-130	4	30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		10	1.0	ug/L	10		104	70-130	0.8	30
p&m-Xylene		11	1.0	ug/L	10		107	70-130	2	30
p-Isopropyltoluene		11	1.0	ug/L	10		110	70-130	4	30
sec-Butylbenzene		11	1.0	ug/L	10		109	70-130	3	30
Styrene		11	1.0	ug/L	10		106	70-130	2	30
tert-Butylbenzene		11	1.0	ug/L	10		108	70-130	2	30
Tetrachloroethene		10	1.0	ug/L	10		103	70-130	1	30
Tetrahydrofuran (THF)		97	10	ug/L	100		97	70-130	0.6	30
Toluene		11	1.0	ug/L	10		106	70-130	4	30
trans-1,2-Dichloroethene		11	1.0	ug/L	10		106	70-130	4	30
trans-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130	2	30
Trichloroethene (TCE)		11	0.10	ug/L	10		105	70-130	4	30
Trichlorofluoromethane		11	1.0	ug/L	10		107	70-130	6	30
Vinyl chloride		10	0.050	ug/L	10		100	70-130	6	30

Duplicate (B9F0130-DUP1)

Source: 19E2198-03

Prepared: 06/07/19 15:47 Analyzed: 06/07/19 15:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		103	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Duplicate (B9F0130-DUP1)		Source: 19E2198-03		Prepared: 06/07/19 15:47		Analyzed: 06/07/19 15:47		RPD	RPD Limit
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<			30
1,2-Dichlorobenzene		<	1.0	ug/L		<			30
1,2-Dichloroethane		<	0.20	ug/L		<			30
1,2-Dichloropropane		<	1.0	ug/L		<			30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<			30
1,3-Dichlorobenzene		<	1.0	ug/L		<			30
1,3-Dichloropropane		<	1.0	ug/L		<			30
1,4-Dichlorobenzene		0.29	1.0	ug/L		<		7	30
2,2-Dichloropropane		<	1.0	ug/L		<			30
2-Chlorotoluene		<	1.0	ug/L		<			30
4-Chlorotoluene		<	1.0	ug/L		<			30
Acetone		<	20	ug/L		<			30
Allyl chloride		<	1.0	ug/L		<			30
Benzene		0.11	0.50	ug/L		<		0	30
Bromobenzene		<	1.0	ug/L		<			30
Bromochloromethane		<	1.0	ug/L		<			30
Bromodichloromethane		<	1.0	ug/L		<			30
Bromoform		<	1.0	ug/L		<			30
Bromomethane		<	2.0	ug/L		<			30
Carbon tetrachloride		<	0.20	ug/L		<			30
Chlorobenzene		<	1.0	ug/L		<			30
Chlorodibromomethane		<	0.50	ug/L		<			30
Chloroethane		<	1.0	ug/L		<			30
Chloroform		<	1.0	ug/L		<			30
Chloromethane		<	1.0	ug/L		<			30
cis-1,2-Dichloroethene		<	1.0	ug/L		<			30
cis-1,3-Dichloropropene		<	0.50	ug/L		<			30
Dibromomethane		<	1.0	ug/L		<			30
Dichlorodifluoromethane		<	1.0	ug/L		<			30
Dichlorofluoromethane		<	1.0	ug/L		<			30
Ethyl ether		<	1.0	ug/L		<			30
Ethylbenzene		<	1.0	ug/L		<			30
Hexachlorobutadiene		<	0.50	ug/L		<			30
Isopropylbenzene		<	1.0	ug/L		<			30
Methyl ethyl ketone (MEK)		<	10	ug/L		<			30

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Duplicate (B9F0130-DUP1)		Source: 19E2198-03		Prepared: 06/07/19 15:47 Analyzed: 06/07/19 15:47						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		<	10	ug/L		<				30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		0.060	0.10	ug/L		<			15	30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		<	0.050	ug/L		<				30

Matrix Spike (B9F0130-MS1)		Source: 19E2198-02		Prepared: 06/07/19 12:05 Analyzed: 06/07/19 12:05						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10	<	100	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	108	70-130		
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10	<	95	70-130		
1,1,2-Trichloroethane		9.6	0.50	ug/L	10	<	96	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10	<	115	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	105	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	109	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10	<	110	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Matrix Spike (B9F0130-MS1)		Source: 19E2198-02		Prepared: 06/07/19 12:05 Analyzed: 06/07/19 12:05						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2,3-Trichloropropane		9.1	0.20	ug/L	10	<	91	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10	<	110	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.7	1.0	ug/L	10	<	97	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	101	70-130		
1,2-Dichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2-Dichloroethane		9.4	0.20	ug/L	10	<	94	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10	<	100	70-130		
1,3,5-Trimethylbenzene		11	1.0	ug/L	10	<	109	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichloropropane		9.7	1.0	ug/L	10	<	97	70-130		
1,4-Dichlorobenzene		11	1.0	ug/L	10	<	104	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	116	70-130		
2-Chlorotoluene		11	1.0	ug/L	10	<	107	70-130		
4-Chlorotoluene		11	1.0	ug/L	10	<	107	70-130		
Acetone		98	20	ug/L	100	<	98	70-130		
Allyl chloride		10	1.0	ug/L	10	<	101	70-130		
Benzene		11	0.50	ug/L	10	<	107	70-130		
Bromobenzene		9.9	1.0	ug/L	10	<	99	70-130		
Bromochloromethane		10	1.0	ug/L	10	<	102	70-130		
Bromodichloromethane		10	1.0	ug/L	10	<	101	70-130		
Bromoform		10	1.0	ug/L	10	<	100	70-130		
Bromomethane		10	2.0	ug/L	10	<	105	70-130		
Carbon tetrachloride		11	0.20	ug/L	10	<	109	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	104	70-130		
Chlorodibromomethane		10	0.50	ug/L	10	<	100	70-130		
Chloroethane		11	1.0	ug/L	10	<	108	70-130		
Chloroform		10	1.0	ug/L	10	<	104	70-130		
Chloromethane		9.9	1.0	ug/L	10	<	99	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10	<	104	70-130		
cis-1,3-Dichloropropene		9.8	0.50	ug/L	10	<	98	70-130		
Dibromomethane		9.5	1.0	ug/L	10	<	95	70-130		
Dichlorodifluoromethane		11	1.0	ug/L	10	<	109	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10	<	110	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Analyte	Analyte Qualifier(s)	Source: 19E2198-02		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
		Result	Reporting Limit							
Ethyl ether		10	1.0	ug/L	10	<	101	70-130		
Ethylbenzene		11	1.0	ug/L	10	<	108	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10	<	115	70-130		
Isopropylbenzene		12	1.0	ug/L	10	<	115	70-130		
Methyl ethyl ketone (MEK)		50	10	ug/L	50	<	100	70-130		
Methyl isobutyl ketone (MIBK)		53	5.0	ug/L	50	<	107	70-130		
Methyl tertiary butyl ether (MTBE)		9.7	2.0	ug/L	10	<	97	70-130		
Methylene chloride		10	1.0	ug/L	10	<	101	70-130		
Naphthalene		10	1.0	ug/L	10	<	102	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	112	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	110	70-130		
o-Xylene		11	1.0	ug/L	10	<	109	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	114	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10	<	114	70-130		
sec-Butylbenzene		12	1.0	ug/L	10	<	116	70-130		
Styrene		11	1.0	ug/L	10	<	109	70-130		
tert-Butylbenzene		11	1.0	ug/L	10	<	112	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	110	70-130		
Tetrahydrofuran (THF)		91	10	ug/L	100	<	91	70-130		
Toluene		11	1.0	ug/L	10	<	109	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	106	70-130		
trans-1,3-Dichloropropene		9.7	0.50	ug/L	10	<	97	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	108	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10	<	111	70-130		
Vinyl chloride		10	0.050	ug/L	10	<	104	70-130		

FINAL REPORT

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0117 - 1,4 Dioxane in Water SPE

Blank (B9F0117-BLK1)				Prepared: 06/09/19 08:00 Analyzed: 06/09/19 14:52						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	Q9	<	0.050	ug/L						

LCS (B9F0117-BS1)				Prepared: 06/09/19 08:00 Analyzed: 06/09/19 15:08						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	Q9	0.22	0.052	ug/L	0.20		105	80-120		

LCS Dup (B9F0117-BSD1)				Prepared: 06/09/19 08:00 Analyzed: 06/09/19 15:25						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	Q9	0.23	0.051	ug/L	0.20		112	80-120	6	20

Batch B9F0163 - 1,4 Dioxane in Water SPE

Blank (B9F0163-BLK1)				Prepared: 06/10/19 08:00 Analyzed: 06/10/19 14:58						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.053	ug/L						

LCS (B9F0163-BS1)				Prepared: 06/10/19 08:00 Analyzed: 06/10/19 15:15						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.21	0.051	ug/L	0.20		104	80-120		

Duplicate (B9F0163-DUP1)				Prepared: 06/10/19 08:00 Analyzed: 06/10/19 16:05						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L		<				30

Matrix Spike (B9F0163-MS1)				Prepared: 06/10/19 08:00 Analyzed: 06/10/19 16:38						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.73	0.051	ug/L	0.45	0.29	96	70-130		

FINAL REPORT

Report ID: 06192019 93716

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0037 - PFCs Preparation

Blank (B9F0037-BLK1)

Prepared: 06/04/19 15:40 Analyzed: 06/04/19 15:40

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9F0037-BLK2)

Prepared: 06/04/19 19:08 Analyzed: 06/04/19 19:08

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9F0037-BS1)

Prepared: 06/04/19 15:31 Analyzed: 06/04/19 15:31

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.55	0.050	ug/L	0.50		110	80-120		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		101	80-120		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50		106	80-120		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5		99	80-120		
Perfluorooctanesulfonate (PFOS)		0.50	0.015	ug/L	0.49		99	80-120		
Perfluorooctanoic acid (PFOA)		0.48	0.035	ug/L	0.5		96	80-120		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5		101	80-120		

LCS Dup (B9F0037-BSD1)

Prepared: 06/04/19 18:59 Analyzed: 06/04/19 18:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		100	80-120	9	20
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		101	80-120	0.1	20
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50		105	80-120	1	20

FINAL REPORT

Report ID: 06192019 93716

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/19/19 9:37

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0037 - PFCs Preparation

LCS Dup (B9F0037-BSD1)

Prepared: 06/04/19 18:59 Analyzed: 06/04/19 18:59

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5		108	80-120	9	20
Perfluorooctanesulfonate (PFOS)		0.52	0.015	ug/L	0.49		104	80-120	5	20
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5		100	80-120	3	20
Perfluoropentanoic acid (PFPeA)		0.52	0.050	ug/L	0.5		104	80-120	2	20

Matrix Spike (B9F0037-MS1)

Source: 19E2061-07

Prepared: 06/04/19 15:56 Analyzed: 06/04/19 15:56

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.54	0.050	ug/L	0.50	<	108	70-130		
Perfluorobutanoic acid (PFBA)		1.4	0.050	ug/L	0.5	0.82	107	70-130		
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5	<	103	70-130		
Perfluorooctanesulfonate (PFOS)		0.52	0.015	ug/L	0.49	<	105	70-130		
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5	<	98	70-130		
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike Dup (B9F0037-MSD1)

Source: 19E2061-07

Prepared: 06/04/19 16:05 Analyzed: 06/04/19 16:05

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130	6	20
Perfluorobutanoic acid (PFBA)		1.3	0.050	ug/L	0.5	0.82	101	70-130	2	20
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	102	70-130	4	20
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5	<	100	70-130	3	20
Perfluorooctanesulfonate (PFOS)		0.50	0.015	ug/L	0.49	<	101	70-130	4	20
Perfluorooctanoic acid (PFOA)		0.51	0.035	ug/L	0.5	<	103	70-130	5	20
Perfluoropentanoic acid (PFPeA)		0.53	0.050	ug/L	0.5	<	101	70-130	0.8	20

FINAL REPORT

Report ID: 06192019 93716

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

Q9	Insufficient sample received to meet method quality control requirements.
J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 6/20/19

Client Name: QW - MPCA - Closed Landfill Assessment

Project Code: QW

Project Name: Closed Landfill Assessment

Work Order Number: 19F0098

Report To: QW - MPCA - Closed Landfill Assessment

Mark Umholtz

520 Lafayette Rd.

Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Moyer", is written over a light gray rectangular background.

Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164
(651) 201-5300

<http://www.health.mn.us/divs/phl/environmental>

Final Report
 Summary of Samples Received

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Work Order Comment: The parent sample for QC-FR SP-06 is SP-05 per M. Umholtz. -CCS 06/05/19

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
834659	19F0098-01	Wtr-Ground	06/03/19 10:00	06/04/19 9:48	3.0
837777	19F0098-02	Wtr-Ground	06/03/19 12:15	06/04/19 9:48	3.0
837776	19F0098-03	Wtr-Ground	06/03/19 13:15	06/04/19 9:48	3.0
FB-3	19F0098-04	QC-BLANK	06/03/19 13:50	06/04/19 9:48	3.0
603282	19F0098-05	Wtr-Ground	06/03/19 15:30	06/04/19 9:48	3.0
M-3	19F0098-06	Wtr-Ground	06/03/19 15:35	06/04/19 9:48	3.0

Field ID	MDH Sample Number	Receiving Comments
834659	19F0098-01	(MW-9) Strong Odor
837777	19F0098-02	(MW-9D)
837776	19F0098-03	(MW-10D)
FB-3	19F0098-04	(Field Blank 3)
603282	19F0098-05	(MW-97-2) / Parent sample for QC-FR -CCS
M-3	19F0098-06	(Duplicate 3)

FINAL REPORT

Report ID: 06202019 91932

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health



Chain-of-Custody Form rev. MAR 2013.0909

Work Order Number: _____ COC Type: Standard
 Turnaround Time: Standard COC ID: _____

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MN SW-057 Program Code (MDH Lab Only): **QW**
 Project Name: 19-01567 MPCA Freeway Landfill 2019 MDH Project Task Code: PRJ07786
 Project Manager: Mark Umholtz 651-757-2308
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name: Minnesota Department of Health
 Address: 601 Robert Street N.
 St. Paul MN 55155
 Phone No: 651-201-5058



SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES
 Sample-Routine Sample
 S-IVP-Integrated Vertical Profile Sample
 S-CWOP-Composite Sample

QC-FB-Field Blank Sample
 QC-FR-Field Replicate Sample
 QC-TB-Trip Blank Sample

LAB MATRIX CODES
 DW-Drinking Water
 NW-Non-potable Water
 SD-Soil/Solid
 WP-Wipe

AR-Air
 BL-Biological Material
 OT-Other
 TS-Tissue

FIELD MATRIX CODES
 Wtr-Ground-Groundwater
 Wtr-Surf-Surface Water
 QC-BLANK-Artificial Blank Water
 Leachate-Leachate Sample

PRESERV. HCl None None
 ANALYSIS VOCs EPA 8260D PFAS by MDH555 1,4 Dioxane

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Lab Sample No.	#
834659	sample	6/3/19	1000			G	NW	Wtr-Ground	N	(mw-9) strong odor	5	X	-01	1
837777	sample	6/3/19	1215			G	NW	Wtr-Ground	N	(mw-9D)	5	X	-02	2
837776	sample	6/3/19	1315			G	NW	Wtr-Ground	N	(mw-10D)	5	X	-03	3
F.B-3	QC-FB	6/3/19	1350			G	NW	QC-BLANK	N	(Field Blank 3)	5	X	-04	4
603282	sample	6/3/19	1530			G	NW	Wtr-Ground	N	(mw-97-2)	5	X	-05	5
M-3	QC-FR	6/3/19	1535			G	NW	Wtr-Ground	N	(Duplicate 3)	5	X	-06	6
									N					7
									N					8
									N					9
									N					10

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #: _____

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <u>David Anderson / Pace Analytical</u>	<u>6/3/19 / 1630</u>	<u>[Signature] MDH</u>	<u>6-4-19/1948</u>

Sample Condition Upon Receipt
Minnesota Department of Health Public Health Laboratory



Data Entry Worksheet

Parcel Information

Date & time of receipt: JUN 4 '19 9:48

Courier: Walk-in FedEx Spee-Dee UPS USPS Other courier _____

Tracking # _____

After hours drop-off: Refrigerator (207) (186) () Freezer (185) () Unrefrigerated

Parcel: Plastic cooler Styrofoam/cardboard cooler Cardboard box Envelope Plastic can
 None Other _____ Info: _____

Custody seals present: No; Yes, If "Yes" Custody seals intact: Yes; No _____

Custody seal # _____ Evidentiary samples identified: No; Yes

Packaging & Temperature Information

Packing material: Bubble wrap Styrofoam Paper None Other _____

Cooling material: Wet ice (loose) Wet ice pack # (4) Gel pack # () Dry ice None
 Other _____

Condition of cooling material: Solid Partially frozen Liquid; Liquid temperature: _____ °C N/A

Representative sample temperature: 3.0 °C IR thermometer instrument used: #10

Samples received without evidence of freezing: Yes; No _____

Initials of person receiving parcel: TS

Chain of Custody, Sample Container & Analysis Information

Chain of custody received with sample containers: Yes; No

Chain of custody type: Standard Civil Criminal Priority/Emergency Unknown

All sample containers are unique to a sample point listed on the chain of custody: Yes; No

All sample containers have been collected prior to the expiration date listed on container label:
 Yes; No; Unknown _____

All sample containers received intact: Yes; No _____

All sample containers are appropriate for requested analysis: Yes; No; Unknown

All analysis have been received within the specified holding time for analysis: Yes; No Unknown

Rad Chem. request received: Yes; No, If "Yes" sample survey results: < 0.5 mrem/hr ≥ 0.5 mrem/hr

Rad Chem. meter calibration date verified: Yes; No

Sample submission details are entered in the Environmental Laboratory LIMS.

Initials of person logging in the work order request into LIMS: TS

Final Report
Case Narrative

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name: MN SW-057
Collected by: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/2019 9:19

Except where noted in this report, no additional comments are needed for this Work Order.

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-01

Location ID: 834659	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: (MW-9) Strong Odor

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Surrogate: 4-Bromofluorobenzene		105	70-130	%	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2,4-Trimethylbenzene		14	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,3,5-Trimethylbenzene		2.1	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
1,4-Dichlorobenzene		2.4	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D

FINAL REPORT

Report ID: 06202019 91932

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-01

Location ID: 834659	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-9) Strong Odor

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
2-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
4-Chlorotoluene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Acetone		150	20	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Benzene		11	0.50	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Chlorobenzene		5.4	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Chloroethane		2.1	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Dichlorofluoromethane		1.7	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Ethyl ether		21	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Ethylbenzene		2.4	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Isopropylbenzene		2.9	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Methyl ethyl ketone (MEK)		49	10	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D

FINAL REPORT

Report ID: 06202019 91932

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW
 Program Name: Closed Landfill Assessment
 Collected By: David Anderson
 Collector ID: None

Project ID: PRJ07786
 Facility Name/ID: MN SW-057
 City: 19-01567 MPCA Freeway Landfill 2019 MDH
 Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-01

Location ID: 834659
 Field Name: None
 Sampling Point: None
 QA Type: None

Collect Date: 06/03/19
 Collect Time: 10:00
 Matrix: Wtr-Ground

Field Residual Chlorine Result: None
 Field Fluoride Result: None
 Field pH Result: None
 Field PO₄ Result: None

Receiving Comments: (MW-9) Strong Odor

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Methylene chloride		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
n-Propylbenzene		2.6	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
o-Xylene		3.4	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
p&m-Xylene		16	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
p-Isopropyltoluene		1.7	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Tetrahydrofuran (THF)		17	10	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Toluene		1.2	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0130	06/07/19 22:17	06/07/19 22:17	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		2.1	0.051	ug/L	1	B9F0164	06/10/19 08:00	06/17/19 12:53	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.010	0.050	ug/L	1	B9F0100	06/06/19 14:49	06/06/19 14:49	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-01

Location ID: 834659	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-9) Strong Odor

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		0.11	0.025	ug/L	1	B9F0100	06/06/19 14:49	06/06/19 14:49	MDH 555
Perfluorooctanesulfonate (PFOS)		0.10	0.015	ug/L	1	B9F0100	06/06/19 14:49	06/06/19 14:49	MDH 555
Perfluorooctanoic acid (PFOA)		0.30	0.035	ug/L	1	B9F0100	06/06/19 14:49	06/06/19 14:49	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-01RE1

Location ID: 834659	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 10:00	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: (MW-9) Strong Odor

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	1	B9F0193	06/11/19 18:53	06/11/19 18:53	EPA 8260D
Surrogate: 4-Bromofluorobenzene		100	70-130	%	1	B9F0193	06/11/19 18:53	06/11/19 18:53	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	1	B9F0193	06/11/19 18:53	06/11/19 18:53	EPA 8260D
Naphthalene	D2	93	10	ug/L	1	B9F0193	06/11/19 18:53	06/11/19 18:53	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanoic acid (PFBA)	D1, J	0.063	0.25	ug/L	5	B9F0167	06/10/19 12:05	06/10/19 12:05	MDH 555
Perfluorohexanoic acid (PFHxA)	D1, J	0.043	0.25	ug/L	5	B9F0167	06/10/19 12:05	06/10/19 12:05	MDH 555
Perfluoropentanoic acid (PFPeA)	D1	<	0.25	ug/L	5	B9F0167	06/10/19 12:05	06/10/19 12:05	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-02

Location ID: 837777	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-9D)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Surrogate: 4-Bromofluorobenzene		101	70-130	%	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-02

Location ID: 837777	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: (MW-9D)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Acetone		<	20	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Chlorobenzene		1.3	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Ethyl ether		16	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-02

Location ID: 837777	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-9D)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Tetrahydrofuran (THF)		18	10	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0193	06/11/19 19:20	06/11/19 19:20	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.020	0.050	ug/L	1	B9F0100	06/06/19 14:57	06/06/19 14:57	MDH 555
Perfluorobutanoic acid (PFBA)		0.60	0.050	ug/L	1	B9F0100	06/06/19 14:57	06/06/19 14:57	MDH 555
Perfluorohexanesulfonate (PFHxS)		0.063	0.025	ug/L	1	B9F0100	06/06/19 14:57	06/06/19 14:57	MDH 555
Perfluorohexanoic acid (PFHxA)		0.11	0.050	ug/L	1	B9F0100	06/06/19 14:57	06/06/19 14:57	MDH 555
Perfluorooctanesulfonate (PFOS)		0.13	0.015	ug/L	1	B9F0100	06/06/19 14:57	06/06/19 14:57	MDH 555
Perfluorooctanoic acid (PFOA)		0.32	0.035	ug/L	1	B9F0100	06/06/19 14:57	06/06/19 14:57	MDH 555

FINAL REPORT

Report ID: 06202019 91932

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-02

Location ID: 837777	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-9D)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluoropentanoic acid (PFPeA)		0.081	0.050	ug/L	1	B9F0100	06/06/19 14:57	06/06/19 14:57	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-02RE1

Location ID: 837777	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 12:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-9D)

Results were produced by the Minnesota Department of Health, except where noted.

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	35	0.21	ug/L	4	B9F0164	06/10/19 08:00	06/18/19 10:25	EPA 522 Modified

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-03

Location ID: 837776	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO4 Result: None

Receiving Comments: (MW-10D)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		102	70-130	%	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Surrogate: 4-Bromofluorobenzene		100	70-130	%	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		97	70-130	%	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D

FINAL REPORT

Report ID: 06202019 91932

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-03

Location ID: 837776	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-10D)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Acetone		<	20	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Ethyl ether		10	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D

FINAL REPORT

Report ID: 06202019 91932

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-03

Location ID: 837776	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-10D)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Tetrahydrofuran (THF)		13	10	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0193	06/11/19 19:48	06/11/19 19:48	EPA 8260D

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)	J	0.010	0.050	ug/L	1	B9F0100	06/06/19 15:06	06/06/19 15:06	MDH 555
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	1	B9F0100	06/06/19 15:06	06/06/19 15:06	MDH 555
Perfluorohexanesulfonate (PFHxS)		0.033	0.025	ug/L	1	B9F0100	06/06/19 15:06	06/06/19 15:06	MDH 555
Perfluorohexanoic acid (PFHxA)		0.084	0.050	ug/L	1	B9F0100	06/06/19 15:06	06/06/19 15:06	MDH 555
Perfluorooctanesulfonate (PFOS)		0.073	0.015	ug/L	1	B9F0100	06/06/19 15:06	06/06/19 15:06	MDH 555
Perfluorooctanoic acid (PFOA)		0.58	0.035	ug/L	1	B9F0100	06/06/19 15:06	06/06/19 15:06	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-03

Location ID: 837776	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-10D)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluoropentanoic acid (PFPeA)		0.072	0.050	ug/L	1	B9F0100	06/06/19 15:06	06/06/19 15:06	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-03RE1

Location ID: 837776	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:15	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-10D)

Results were produced by the Minnesota Department of Health, except where noted.

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane	D2	27	0.20	ug/L	4	B9F0164	06/10/19 08:00	06/18/19 10:42	EPA 522 Modified

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-04

Location ID: FB-3	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO4 Result: None

Receiving Comments: (Field Blank 3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Surrogate: 4-Bromofluorobenzene		100	70-130	%	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		97	70-130	%	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D

FINAL REPORT

Report ID: 06202019 91932

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-04

Location ID: FB-3	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO4 Result: None

Receiving Comments: (Field Blank 3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Acetone		<	20	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Chloroform		3.1	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-04

Location ID: FB-3	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO4 Result: None

Receiving Comments: (Field Blank 3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		2.7	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0193	06/11/19 20:16	06/11/19 20:16	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.078	0.050	ug/L	1	B9F0164	06/10/19 08:00	06/17/19 13:43	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9F0100	06/06/19 15:14	06/06/19 15:14	MDH 555
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L	1	B9F0100	06/06/19 15:14	06/06/19 15:14	MDH 555

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-04

Location ID: FB-3	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 13:50	Field Fluoride Result: None
Sampling Point: None	Matrix: QC-BLANK	Field pH Result: None
QA Type: Field Blank		Field PO ₄ Result: None

Receiving Comments: (Field Blank 3)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9F0100	06/06/19 15:14	06/06/19 15:14	MDH 555
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L	1	B9F0100	06/06/19 15:14	06/06/19 15:14	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L	1	B9F0100	06/06/19 15:14	06/06/19 15:14	MDH 555
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L	1	B9F0100	06/06/19 15:14	06/06/19 15:14	MDH 555
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L	1	B9F0100	06/06/19 15:14	06/06/19 15:14	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-05

Location ID: 603282	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-2) / Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Surrogate: 4-Bromofluorobenzene		101	70-130	%	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		97	70-130	%	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-05

Location ID: 603282	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-2) / Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Acetone		<	20	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D

FINAL REPORT

Report ID: 06202019 91932

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-05

Location ID: 603282	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-2) / Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0193	06/11/19 20:44	06/11/19 20:44	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.12	0.049	ug/L	1	B9F0164	06/10/19 08:00	06/17/19 14:00	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9F0100	06/06/19 15:22	06/06/19 15:22	MDH 555
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9F0100	06/06/19 15:22	06/06/19 15:22	MDH 555

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-05

Location ID: 603282	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-2) / Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanoic acid (PFHxA)	J	0.008	0.050	ug/L	1	B9F0100	06/06/19 15:22	06/06/19 15:22	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L	1	B9F0100	06/06/19 15:22	06/06/19 15:22	MDH 555
Perfluorooctanoic acid (PFOA)	J	0.009	0.035	ug/L	1	B9F0100	06/06/19 15:22	06/06/19 15:22	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.006	0.050	ug/L	1	B9F0100	06/06/19 15:22	06/06/19 15:22	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-05RE1

Location ID: 603282	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:30	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: None		Field PO ₄ Result: None

Receiving Comments: (MW-97-2) / Parent sample for QC-FR -CCS

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanoic acid (PFBA)	D1	<	0.25	ug/L	5	B9F0167	06/10/19 12:13	06/10/19 12:13	MDH 555

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-06

Location ID: M-3	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:35	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO ₄ Result: None

Receiving Comments: (Duplicate 3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Surrogate: 4-Bromofluorobenzene		101	70-130	%	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Surrogate: Methyl tertiary butyl ether-d3		97	70-130	%	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,1,1-Trichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,1,2,2-Tetrachloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,1,2-Trichloroethane		<	0.50	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,1-Dichloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,1-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,1-Dichloropropene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2,3-Trichloropropane		<	0.20	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2,4-Trichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2-Dibromoethane (EDB)		<	0.50	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2-Dichloroethane		<	0.20	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,3-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,3-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
1,4-Dichlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
2,2-Dichloropropane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
2-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D

FINAL REPORT

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-06

Location ID: M-3	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:35	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Receiving Comments: (Duplicate 3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
4-Chlorotoluene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Acetone		<	20	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Allyl chloride		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Benzene		<	0.50	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Bromobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Bromochloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Bromodichloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Bromoform		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Bromomethane		<	2.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Carbon tetrachloride		<	0.20	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Chlorobenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Chlorodibromomethane		<	0.50	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Chloroethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Chloroform		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Chloromethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
cis-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Dibromomethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Dichlorodifluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Dichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Ethyl ether		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Ethylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Hexachlorobutadiene		<	0.50	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Isopropylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Methyl ethyl ketone (MEK)		<	10	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-06

Location ID: M-3	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:35	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO4 Result: None

Receiving Comments: (Duplicate 3)

Results were produced by the Minnesota Department of Health, except where noted.

VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Methylene chloride		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Naphthalene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
n-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
n-Propylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
o-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
p&m-Xylene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
p-Isopropyltoluene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
sec-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Styrene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
tert-Butylbenzene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Tetrachloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Tetrahydrofuran (THF)		<	10	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Toluene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
trans-1,3-Dichloropropene		<	0.50	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Trichloroethene (TCE)		<	0.10	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Trichlorofluoromethane		<	1.0	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D
Vinyl chloride		<	0.050	ug/L	1	B9F0193	06/11/19 21:11	06/11/19 21:11	EPA 8260D

1,4-Dioxane

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dioxane		0.15	0.049	ug/L	1	B9F0164	06/10/19 08:00	06/17/19 14:17	EPA 522 Modified

PFC Expanded List

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L	1	B9F0100	06/06/19 15:31	06/06/19 15:31	MDH 555
Perfluorobutanoic acid (PFBA)	J	0.032	0.050	ug/L	1	B9F0100	06/06/19 15:31	06/06/19 15:31	MDH 555

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Final Report
 Analytical Results

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

MDH Sample Number: 19F0098-06

Location ID: M-3	Collect Date: 06/03/19	Field Residual Chlorine Result: None
Field Name: None	Collect Time: 15:35	Field Fluoride Result: None
Sampling Point: None	Matrix: Wtr-Ground	Field pH Result: None
QA Type: Field Dup/Rep		Field PO ₄ Result: None

Receiving Comments: (Duplicate 3)

Results were produced by the Minnesota Department of Health, except where noted.

PFC Expanded List - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L	1	B9F0100	06/06/19 15:31	06/06/19 15:31	MDH 555
Perfluorohexanoic acid (PFHxA)	J	0.009	0.050	ug/L	1	B9F0100	06/06/19 15:31	06/06/19 15:31	MDH 555
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L	1	B9F0100	06/06/19 15:31	06/06/19 15:31	MDH 555
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L	1	B9F0100	06/06/19 15:31	06/06/19 15:31	MDH 555
Perfluoropentanoic acid (PFPeA)	J	0.006	0.050	ug/L	1	B9F0100	06/06/19 15:31	06/06/19 15:31	MDH 555

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Batch Summary

Samples in Batch: B9F0100 - PFCs Preparation

19F0098-01 19F0098-02 19F0098-03 19F0098-04 19F0098-05 19F0098-06

Samples in Batch: B9F0130 - EPA 5030B Preparation

19F0098-01

Samples in Batch: B9F0164 - 1,4 Dioxane in Water SPE

19F0098-01 19F0098-02RE1 19F0098-03RE1 19F0098-04 19F0098-05 19F0098-06

Samples in Batch: B9F0167 - PFCs Preparation

19F0098-01RE1 19F0098-05RE1

Samples in Batch: B9F0193 - EPA 5030B Preparation

19F0098-01RE1 19F0098-02 19F0098-03 19F0098-04 19F0098-05 19F0098-06

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		101	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		103	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		99	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						

FINAL REPORT

Report ID: 06202019 91932

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane		<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Blank (B9F0130-BLK1)

Prepared: 06/07/19 13:28 Analyzed: 06/07/19 13:28

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		101	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.8	1.0	ug/L	10		98	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		100	70-130		
1,1,2,2-Tetrachloroethane		9.7	0.50	ug/L	10		97	70-130		
1,1,2-Trichloroethane		9.5	0.50	ug/L	10		95	70-130		
1,1,2-Trichlorotrifluoroethane		10	1.0	ug/L	10		105	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		100	70-130		
1,1-Dichloroethene		10	1.0	ug/L	10		102	70-130		
1,1-Dichloropropene		10	1.0	ug/L	10		103	70-130		
1,2,3-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,2,3-Trichloropropane		9.5	0.20	ug/L	10		95	70-130		
1,2,4-Trichlorobenzene		9.9	1.0	ug/L	10		99	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		107	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		101	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		101	70-130		
1,2-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2-Dichloroethane		9.2	0.20	ug/L	10		92	70-130		
1,2-Dichloropropane		9.6	1.0	ug/L	10		96	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		105	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10		100	70-130		
1,3-Dichloropropane		9.7	1.0	ug/L	10		97	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10		101	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		107	70-130		
2-Chlorotoluene		10	1.0	ug/L	10		104	70-130		
4-Chlorotoluene		10	1.0	ug/L	10		102	70-130		
Acetone		100	20	ug/L	100		104	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		10	1.0	ug/L	10		100	70-130		
Benzene		10	0.50	ug/L	10		100	70-130		
Bromobenzene		9.6	1.0	ug/L	10		96	70-130		
Bromochloromethane		9.9	1.0	ug/L	10		99	70-130		
Bromodichloromethane		9.8	1.0	ug/L	10		98	70-130		
Bromoform		11	1.0	ug/L	10		108	70-130		
Bromomethane		9.2	2.0	ug/L	10		92	70-130		
Carbon tetrachloride		10	0.20	ug/L	10		101	70-130		
Chlorobenzene		10	1.0	ug/L	10		100	70-130		
Chlorodibromomethane		10	0.50	ug/L	10		103	70-130		
Chloroethane		9.9	1.0	ug/L	10		99	70-130		
Chloroform		10	1.0	ug/L	10		100	70-130		
Chloromethane		9.2	1.0	ug/L	10		92	70-130		
cis-1,2-Dichloroethene		9.8	1.0	ug/L	10		98	70-130		
cis-1,3-Dichloropropene		9.7	0.50	ug/L	10		97	70-130		
Dibromomethane		9.4	1.0	ug/L	10		94	70-130		
Dichlorodifluoromethane		9.8	1.0	ug/L	10		98	70-130		
Dichlorofluoromethane		10	1.0	ug/L	10		100	70-130		
Ethyl ether		9.6	1.0	ug/L	10		96	70-130		
Ethylbenzene		10	1.0	ug/L	10		102	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10		107	70-130		
Isopropylbenzene		11	1.0	ug/L	10		107	70-130		
Methyl ethyl ketone (MEK)		52	10	ug/L	50		105	70-130		
Methyl isobutyl ketone (MIBK)		54	5.0	ug/L	50		108	70-130		
Methyl tertiary butyl ether (MTBE)		9.6	2.0	ug/L	10		96	70-130		
Methylene chloride		9.6	1.0	ug/L	10		96	70-130		
Naphthalene		10	1.0	ug/L	10		100	70-130		
n-Butylbenzene		11	1.0	ug/L	10		105	70-130		
n-Propylbenzene		10	1.0	ug/L	10		105	70-130		
o-Xylene		10	1.0	ug/L	10		103	70-130		
p&m-Xylene		11	1.0	ug/L	10		106	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10		106	70-130		
sec-Butylbenzene		11	1.0	ug/L	10		106	70-130		
Styrene		10	1.0	ug/L	10		104	70-130		
tert-Butylbenzene		11	1.0	ug/L	10		106	70-130		

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Final Report
 Quality Control

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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS (B9F0130-BS1)

Prepared: 06/07/19 11:09 Analyzed: 06/07/19 11:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		101	70-130		
Tetrahydrofuran (THF)		96	10	ug/L	100		96	70-130		
Toluene		10	1.0	ug/L	10		102	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		101	70-130		
Trichlorofluoromethane		10	1.0	ug/L	10		102	70-130		
Vinyl chloride		9.4	0.050	ug/L	10		94	70-130		

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		99	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130	0.7	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		106	70-130	6	30
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130	3	30
1,1,2-Trichloroethane		9.6	0.50	ug/L	10		96	70-130	0.8	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		108	70-130	3	30
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130	4	30
1,1-Dichloroethene		11	1.0	ug/L	10		109	70-130	6	30
1,1-Dichloropropene		11	1.0	ug/L	10		108	70-130	4	30
1,2,3-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130	2	30
1,2,3-Trichloropropane		9.3	0.20	ug/L	10		93	70-130	3	30
1,2,4-Trichlorobenzene		10	1.0	ug/L	10		101	70-130	2	30
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		109	70-130	2	30
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10		101	70-130	0.2	30
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10		100	70-130	1	30
1,2-Dichlorobenzene		9.7	1.0	ug/L	10		97	70-130	0.5	30
1,2-Dichloroethane		9.3	0.20	ug/L	10		93	70-130	2	30
1,2-Dichloropropane		9.9	1.0	ug/L	10		99	70-130	2	30
1,3,5-Trimethylbenzene		11	1.0	ug/L	10		106	70-130	1	30
1,3-Dichlorobenzene		10	1.0	ug/L	10		101	70-130	1	30

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Final Report
 Quality Control

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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		9.7	1.0	ug/L	10		97	70-130	0.4	30
1,4-Dichlorobenzene		10	1.0	ug/L	10		100	70-130	0.5	30
2,2-Dichloropropane		11	1.0	ug/L	10		111	70-130	4	30
2-Chlorotoluene		10	1.0	ug/L	10		105	70-130	1	30
4-Chlorotoluene		10	1.0	ug/L	10		104	70-130	1	30
Acetone		100	20	ug/L	100		103	70-130	0.5	30
Allyl chloride		10	1.0	ug/L	10		102	70-130	2	30
Benzene		10	0.50	ug/L	10		104	70-130	5	30
Bromobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
Bromochloromethane		10	1.0	ug/L	10		103	70-130	4	30
Bromodichloromethane		10	1.0	ug/L	10		101	70-130	2	30
Bromoform		11	1.0	ug/L	10		106	70-130	1	30
Bromomethane		10	2.0	ug/L	10		102	70-130	10	30
Carbon tetrachloride		11	0.20	ug/L	10		107	70-130	5	30
Chlorobenzene		10	1.0	ug/L	10		101	70-130	0.7	30
Chlorodibromomethane		10	0.50	ug/L	10		101	70-130	2	30
Chloroethane		10	1.0	ug/L	10		104	70-130	5	30
Chloroform		10	1.0	ug/L	10		103	70-130	2	30
Chloromethane		9.6	1.0	ug/L	10		96	70-130	5	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		102	70-130	4	30
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130	3	30
Dibromomethane		9.5	1.0	ug/L	10		95	70-130	1	30
Dichlorodifluoromethane		10	1.0	ug/L	10		105	70-130	6	30
Dichlorofluoromethane		11	1.0	ug/L	10		106	70-130	6	30
Ethyl ether		10	1.0	ug/L	10		100	70-130	4	30
Ethylbenzene		10	1.0	ug/L	10		104	70-130	2	30
Hexachlorobutadiene		11	0.50	ug/L	10		110	70-130	3	30
Isopropylbenzene		11	1.0	ug/L	10		109	70-130	2	30
Methyl ethyl ketone (MEK)		52	10	ug/L	50		104	70-130	1	30
Methyl isobutyl ketone (MIBK)		53	5.0	ug/L	50		106	70-130	2	30
Methyl tertiary butyl ether (MTBE)		9.8	2.0	ug/L	10		98	70-130	2	30
Methylene chloride		9.7	1.0	ug/L	10		97	70-130	1	30
Naphthalene		10	1.0	ug/L	10		100	70-130	0.2	30
n-Butylbenzene		11	1.0	ug/L	10		107	70-130	1	30
n-Propylbenzene		11	1.0	ug/L	10		109	70-130	4	30

FINAL REPORT

Report ID: 06202019 91932

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

LCS Dup (B9F0130-BSD1)

Prepared: 06/07/19 11:37 Analyzed: 06/07/19 11:37

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		10	1.0	ug/L	10		104	70-130	0.8	30
p&m-Xylene		11	1.0	ug/L	10		107	70-130	2	30
p-Isopropyltoluene		11	1.0	ug/L	10		110	70-130	4	30
sec-Butylbenzene		11	1.0	ug/L	10		109	70-130	3	30
Styrene		11	1.0	ug/L	10		106	70-130	2	30
tert-Butylbenzene		11	1.0	ug/L	10		108	70-130	2	30
Tetrachloroethene		10	1.0	ug/L	10		103	70-130	1	30
Tetrahydrofuran (THF)		97	10	ug/L	100		97	70-130	0.6	30
Toluene		11	1.0	ug/L	10		106	70-130	4	30
trans-1,2-Dichloroethene		11	1.0	ug/L	10		106	70-130	4	30
trans-1,3-Dichloropropene		9.9	0.50	ug/L	10		99	70-130	2	30
Trichloroethene (TCE)		11	0.10	ug/L	10		105	70-130	4	30
Trichlorofluoromethane		11	1.0	ug/L	10		107	70-130	6	30
Vinyl chloride		10	0.050	ug/L	10		100	70-130	6	30

Duplicate (B9F0130-DUP1)

Source: 19E2198-03

Prepared: 06/07/19 15:47 Analyzed: 06/07/19 15:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		103	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		100	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Duplicate (B9F0130-DUP1)

Source: 19E2198-03

Prepared: 06/07/19 15:47 Analyzed: 06/07/19 15:47

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		0.29	1.0	ug/L		<			7	30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		0.11	0.50	ug/L		<			0	30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane		<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		<	1.0	ug/L		<				30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		<	1.0	ug/L		<				30
cis-1,2-Dichloroethene		<	1.0	ug/L		<				30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		<	1.0	ug/L		<				30
Ethyl ether		<	1.0	ug/L		<				30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30

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Final Report
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Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Duplicate (B9F0130-DUP1)		Source: 19E2198-03		Prepared: 06/07/19 15:47 Analyzed: 06/07/19 15:47						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		<	10	ug/L		<				30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		0.060	0.10	ug/L		<			15	30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		<	0.050	ug/L		<				30

Matrix Spike (B9F0130-MS1)		Source: 19E2198-02		Prepared: 06/07/19 12:05 Analyzed: 06/07/19 12:05						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		102	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		96	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10	<	100	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	108	70-130		
1,1,2,2-Tetrachloroethane		9.5	0.50	ug/L	10	<	95	70-130		
1,1,2-Trichloroethane		9.6	0.50	ug/L	10	<	96	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10	<	115	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	105	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10	<	109	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10	<	110	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Matrix Spike (B9F0130-MS1)		Source: 19E2198-02		Prepared: 06/07/19 12:05		Analyzed: 06/07/19 12:05		RPD	RPD Limit	
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2,3-Trichloropropane		9.1	0.20	ug/L	10	<	91	70-130		
1,2,4-Trichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10	<	110	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.7	1.0	ug/L	10	<	97	70-130		
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	101	70-130		
1,2-Dichlorobenzene		10	1.0	ug/L	10	<	100	70-130		
1,2-Dichloroethane		9.4	0.20	ug/L	10	<	94	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10	<	100	70-130		
1,3,5-Trimethylbenzene		11	1.0	ug/L	10	<	109	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10	<	102	70-130		
1,3-Dichloropropane		9.7	1.0	ug/L	10	<	97	70-130		
1,4-Dichlorobenzene		11	1.0	ug/L	10	<	104	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	116	70-130		
2-Chlorotoluene		11	1.0	ug/L	10	<	107	70-130		
4-Chlorotoluene		11	1.0	ug/L	10	<	107	70-130		
Acetone		98	20	ug/L	100	<	98	70-130		
Allyl chloride		10	1.0	ug/L	10	<	101	70-130		
Benzene		11	0.50	ug/L	10	<	107	70-130		
Bromobenzene		9.9	1.0	ug/L	10	<	99	70-130		
Bromochloromethane		10	1.0	ug/L	10	<	102	70-130		
Bromodichloromethane		10	1.0	ug/L	10	<	101	70-130		
Bromoform		10	1.0	ug/L	10	<	100	70-130		
Bromomethane		10	2.0	ug/L	10	<	105	70-130		
Carbon tetrachloride		11	0.20	ug/L	10	<	109	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	104	70-130		
Chlorodibromomethane		10	0.50	ug/L	10	<	100	70-130		
Chloroethane		11	1.0	ug/L	10	<	108	70-130		
Chloroform		10	1.0	ug/L	10	<	104	70-130		
Chloromethane		9.9	1.0	ug/L	10	<	99	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10	<	104	70-130		
cis-1,3-Dichloropropene		9.8	0.50	ug/L	10	<	98	70-130		
Dibromomethane		9.5	1.0	ug/L	10	<	95	70-130		
Dichlorodifluoromethane		11	1.0	ug/L	10	<	109	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10	<	110	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0130 - EPA 5030B Preparation

Matrix Spike (B9F0130-MS1)		Source: 19E2198-02		Prepared: 06/07/19 12:05 Analyzed: 06/07/19 12:05						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ethyl ether		10	1.0	ug/L	10	<	101	70-130		
Ethylbenzene		11	1.0	ug/L	10	<	108	70-130		
Hexachlorobutadiene		11	0.50	ug/L	10	<	115	70-130		
Isopropylbenzene		12	1.0	ug/L	10	<	115	70-130		
Methyl ethyl ketone (MEK)		50	10	ug/L	50	<	100	70-130		
Methyl isobutyl ketone (MIBK)		53	5.0	ug/L	50	<	107	70-130		
Methyl tertiary butyl ether (MTBE)		9.7	2.0	ug/L	10	<	97	70-130		
Methylene chloride		10	1.0	ug/L	10	<	101	70-130		
Naphthalene		10	1.0	ug/L	10	<	102	70-130		
n-Butylbenzene		11	1.0	ug/L	10	<	112	70-130		
n-Propylbenzene		11	1.0	ug/L	10	<	110	70-130		
o-Xylene		11	1.0	ug/L	10	<	109	70-130		
p&m-Xylene		11	1.0	ug/L	10	<	114	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10	<	114	70-130		
sec-Butylbenzene		12	1.0	ug/L	10	<	116	70-130		
Styrene		11	1.0	ug/L	10	<	109	70-130		
tert-Butylbenzene		11	1.0	ug/L	10	<	112	70-130		
Tetrachloroethene		11	1.0	ug/L	10	<	110	70-130		
Tetrahydrofuran (THF)		91	10	ug/L	100	<	91	70-130		
Toluene		11	1.0	ug/L	10	<	109	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	106	70-130		
trans-1,3-Dichloropropene		9.7	0.50	ug/L	10	<	97	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	108	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10	<	111	70-130		
Vinyl chloride		10	0.050	ug/L	10	<	104	70-130		

Batch B9F0193 - EPA 5030B Preparation

Blank (B9F0193-BLK1)		Prepared: 06/11/19 14:16 Analyzed: 06/11/19 14:16								
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		97	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L						

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

Blank (B9F0193-BLK1)

Prepared: 06/11/19 14:16 Analyzed: 06/11/19 14:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2,2-Tetrachloroethane		<	0.50	ug/L						
1,1,2-Trichloroethane		<	0.50	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2,3-Trichlorobenzene		<	1.0	ug/L						
1,2,3-Trichloropropane		<	0.20	ug/L						
1,2,4-Trichlorobenzene		<	1.0	ug/L						
1,2,4-Trimethylbenzene		<	1.0	ug/L						
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L						
1,2-Dibromoethane (EDB)		<	0.50	ug/L						
1,2-Dichlorobenzene		<	1.0	ug/L						
1,2-Dichloroethane		<	0.20	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3,5-Trimethylbenzene		<	1.0	ug/L						
1,3-Dichlorobenzene		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
1,4-Dichlorobenzene		<	1.0	ug/L						
2,2-Dichloropropane		<	1.0	ug/L						
2-Chlorotoluene		<	1.0	ug/L						
4-Chlorotoluene		<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	0.50	ug/L						
Bromobenzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromodichloromethane		<	1.0	ug/L						
Bromoform		<	1.0	ug/L						
Bromomethane		<	2.0	ug/L						
Carbon tetrachloride		<	0.20	ug/L						
Chlorobenzene		<	1.0	ug/L						
Chlorodibromomethane		<	0.50	ug/L						
Chloroethane		<	1.0	ug/L						

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Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

Blank (B9F0193-BLK1)

Prepared: 06/11/19 14:16 Analyzed: 06/11/19 14:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	0.50	ug/L						
Dibromomethane		<	1.0	ug/L						
Dichlorodifluoromethane		<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Ethylbenzene		<	1.0	ug/L						
Hexachlorobutadiene		<	0.50	ug/L						
Isopropylbenzene		<	1.0	ug/L						
Methyl ethyl ketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						
Methylene chloride		<	1.0	ug/L						
Naphthalene		<	1.0	ug/L						
n-Butylbenzene		<	1.0	ug/L						
n-Propylbenzene		<	1.0	ug/L						
o-Xylene		<	1.0	ug/L						
p&m-Xylene		<	1.0	ug/L						
p-Isopropyltoluene		<	1.0	ug/L						
sec-Butylbenzene		<	1.0	ug/L						
Styrene		<	1.0	ug/L						
tert-Butylbenzene		<	1.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichloroethene		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	0.50	ug/L						
Trichloroethene (TCE)		<	0.10	ug/L						
Trichlorofluoromethane		<	1.0	ug/L						
Vinyl chloride		<	0.050	ug/L						

FINAL REPORT

Report ID: 06202019 91932

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

LCS (B9F0193-BS1)

Prepared: 06/11/19 11:57 Analyzed: 06/11/19 11:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130		
1,1,1-Trichloroethane		10	1.0	ug/L	10		104	70-130		
1,1,2,2-Tetrachloroethane		9.3	0.50	ug/L	10		93	70-130		
1,1,2-Trichloroethane		9.6	0.50	ug/L	10		96	70-130		
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		109	70-130		
1,1-Dichloroethane		10	1.0	ug/L	10		104	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10		107	70-130		
1,1-Dichloropropene		11	1.0	ug/L	10		107	70-130		
1,2,3-Trichlorobenzene		9.3	1.0	ug/L	10		93	70-130		
1,2,3-Trichloropropane		8.9	0.20	ug/L	10		89	70-130		
1,2,4-Trichlorobenzene		9.7	1.0	ug/L	10		97	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		106	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		9.4	1.0	ug/L	10		94	70-130		
1,2-Dibromoethane (EDB)		9.8	0.50	ug/L	10		98	70-130		
1,2-Dichlorobenzene		9.6	1.0	ug/L	10		96	70-130		
1,2-Dichloroethane		9.4	0.20	ug/L	10		94	70-130		
1,2-Dichloropropane		9.9	1.0	ug/L	10		99	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		103	70-130		
1,3-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10		100	70-130		
1,4-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130		
2,2-Dichloropropane		11	1.0	ug/L	10		113	70-130		
2-Chlorotoluene		10	1.0	ug/L	10		102	70-130		
4-Chlorotoluene		10	1.0	ug/L	10		102	70-130		
Acetone		98	20	ug/L	100		98	70-130		
Allyl chloride		11	1.0	ug/L	10		105	70-130		
Benzene		10	0.50	ug/L	10		104	70-130		
Bromobenzene		9.6	1.0	ug/L	10		96	70-130		
Bromochloromethane		10	1.0	ug/L	10		101	70-130		
Bromodichloromethane		10	1.0	ug/L	10		100	70-130		
Bromoform		10	1.0	ug/L	10		100	70-130		

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

LCS (B9F0193-BS1)

Prepared: 06/11/19 11:57 Analyzed: 06/11/19 11:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bromomethane		8.5	2.0	ug/L	10		85	70-130		
Carbon tetrachloride		10	0.20	ug/L	10		103	70-130		
Chlorobenzene		10	1.0	ug/L	10		102	70-130		
Chlorodibromomethane		9.8	0.50	ug/L	10		98	70-130		
Chloroethane		10	1.0	ug/L	10		101	70-130		
Chloroform		10	1.0	ug/L	10		103	70-130		
Chloromethane		9.3	1.0	ug/L	10		93	70-130		
cis-1,2-Dichloroethene		10	1.0	ug/L	10		103	70-130		
cis-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130		
Dibromomethane		9.4	1.0	ug/L	10		94	70-130		
Dichlorodifluoromethane		9.2	1.0	ug/L	10		92	70-130		
Dichlorofluoromethane		11	1.0	ug/L	10		107	70-130		
Ethyl ether		10	1.0	ug/L	10		101	70-130		
Ethylbenzene		10	1.0	ug/L	10		103	70-130		
Hexachlorobutadiene		10	0.50	ug/L	10		104	70-130		
Isopropylbenzene		11	1.0	ug/L	10		109	70-130		
Methyl ethyl ketone (MEK)		50	10	ug/L	50		100	70-130		
Methyl isobutyl ketone (MIBK)		52	5.0	ug/L	50		104	70-130		
Methyl tertiary butyl ether (MTBE)		9.9	2.0	ug/L	10		99	70-130		
Methylene chloride		10	1.0	ug/L	10		100	70-130		
Naphthalene		9.8	1.0	ug/L	10		98	70-130		
n-Butylbenzene		11	1.0	ug/L	10		105	70-130		
n-Propylbenzene		10	1.0	ug/L	10		105	70-130		
o-Xylene		10	1.0	ug/L	10		104	70-130		
p&m-Xylene		11	1.0	ug/L	10		107	70-130		
p-Isopropyltoluene		11	1.0	ug/L	10		107	70-130		
sec-Butylbenzene		11	1.0	ug/L	10		107	70-130		
Styrene		11	1.0	ug/L	10		107	70-130		
tert-Butylbenzene		10	1.0	ug/L	10		104	70-130		
Tetrachloroethene		10	1.0	ug/L	10		100	70-130		
Tetrahydrofuran (THF)		93	10	ug/L	100		93	70-130		
Toluene		10	1.0	ug/L	10		104	70-130		
trans-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130		
trans-1,3-Dichloropropene		10	0.50	ug/L	10		101	70-130		
Trichloroethene (TCE)		10	0.10	ug/L	10		104	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

LCS (B9F0193-BS1)

Prepared: 06/11/19 11:57 Analyzed: 06/11/19 11:57

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Trichlorofluoromethane		10	1.0	ug/L	10		102	70-130		
Vinyl chloride		9.4	0.050	ug/L	10		94	70-130		

LCS Dup (B9F0193-BSD1)

Prepared: 06/11/19 12:25 Analyzed: 06/11/19 12:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	10					
1,1,1,2-Tetrachloroethane		9.9	1.0	ug/L	10		99	70-130	0.6	30
1,1,1-Trichloroethane		11	1.0	ug/L	10		108	70-130	4	30
1,1,2,2-Tetrachloroethane		9.4	0.50	ug/L	10		94	70-130	1	30
1,1,2-Trichloroethane		9.6	0.50	ug/L	10		96	70-130	0.4	30
1,1,2-Trichlorotrifluoroethane		11	1.0	ug/L	10		114	70-130	5	30
1,1-Dichloroethane		11	1.0	ug/L	10		109	70-130	4	30
1,1-Dichloroethene		11	1.0	ug/L	10		110	70-130	3	30
1,1-Dichloropropene		11	1.0	ug/L	10		111	70-130	4	30
1,2,3-Trichlorobenzene		9.6	1.0	ug/L	10		96	70-130	3	30
1,2,3-Trichloropropane		9.1	0.20	ug/L	10		91	70-130	2	30
1,2,4-Trichlorobenzene		9.8	1.0	ug/L	10		98	70-130	1	30
1,2,4-Trimethylbenzene		11	1.0	ug/L	10		108	70-130	3	30
1,2-Dibromo-3-chloropropane (DBCP)		9.7	1.0	ug/L	10		97	70-130	3	30
1,2-Dibromoethane (EDB)		9.7	0.50	ug/L	10		97	70-130	0.7	30
1,2-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	3	30
1,2-Dichloroethane		9.7	0.20	ug/L	10		97	70-130	3	30
1,2-Dichloropropane		10	1.0	ug/L	10		102	70-130	3	30
1,3,5-Trimethylbenzene		11	1.0	ug/L	10		106	70-130	2	30
1,3-Dichlorobenzene		9.8	1.0	ug/L	10		98	70-130	0.3	30
1,3-Dichloropropane		9.7	1.0	ug/L	10		97	70-130	3	30
1,4-Dichlorobenzene		10	1.0	ug/L	10		102	70-130	4	30
2,2-Dichloropropane		12	1.0	ug/L	10		116	70-130	3	30
2-Chlorotoluene		10	1.0	ug/L	10		105	70-130	2	30
4-Chlorotoluene		10	1.0	ug/L	10		104	70-130	2	30
Acetone		97	20	ug/L	100		97	70-130	2	30

FINAL REPORT

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

LCS Dup (B9F0193-BSD1)

Prepared: 06/11/19 12:25 Analyzed: 06/11/19 12:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Allyl chloride		11	1.0	ug/L	10		106	70-130	0.6	30
Benzene		11	0.50	ug/L	10		107	70-130	3	30
Bromobenzene		9.8	1.0	ug/L	10		98	70-130	2	30
Bromochloromethane		10	1.0	ug/L	10		103	70-130	2	30
Bromodichloromethane		10	1.0	ug/L	10		102	70-130	2	30
Bromoform		9.8	1.0	ug/L	10		98	70-130	2	30
Bromomethane		8.7	2.0	ug/L	10		87	70-130	2	30
Carbon tetrachloride		11	0.20	ug/L	10		109	70-130	6	30
Chlorobenzene		10	1.0	ug/L	10		101	70-130	0.9	30
Chlorodibromomethane		9.5	0.50	ug/L	10		95	70-130	3	30
Chloroethane		10	1.0	ug/L	10		102	70-130	1	30
Chloroform		11	1.0	ug/L	10		105	70-130	3	30
Chloromethane		9.1	1.0	ug/L	10		91	70-130	1	30
cis-1,2-Dichloroethene		10	1.0	ug/L	10		104	70-130	1	30
cis-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130	1	30
Dibromomethane		9.6	1.0	ug/L	10		96	70-130	2	30
Dichlorodifluoromethane		9.4	1.0	ug/L	10		94	70-130	2	30
Dichlorofluoromethane		11	1.0	ug/L	10		109	70-130	2	30
Ethyl ether		10	1.0	ug/L	10		100	70-130	1	30
Ethylbenzene		10	1.0	ug/L	10		104	70-130	0.6	30
Hexachlorobutadiene		11	0.50	ug/L	10		106	70-130	3	30
Isopropylbenzene		11	1.0	ug/L	10		109	70-130	0.2	30
Methyl ethyl ketone (MEK)		50	10	ug/L	50		101	70-130	0.1	30
Methyl isobutyl ketone (MIBK)		51	5.0	ug/L	50		102	70-130	2	30
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10		101	70-130	2	30
Methylene chloride		10	1.0	ug/L	10		101	70-130	1	30
Naphthalene		9.8	1.0	ug/L	10		98	70-130	0.9	30
n-Butylbenzene		11	1.0	ug/L	10		109	70-130	3	30
n-Propylbenzene		11	1.0	ug/L	10		108	70-130	3	30
o-Xylene		11	1.0	ug/L	10		106	70-130	1	30
p&m-Xylene		11	1.0	ug/L	10		106	70-130	2	30
p-Isopropyltoluene		11	1.0	ug/L	10		111	70-130	4	30
sec-Butylbenzene		11	1.0	ug/L	10		111	70-130	4	30
Styrene		11	1.0	ug/L	10		106	70-130	0.6	30
tert-Butylbenzene		11	1.0	ug/L	10		109	70-130	4	30

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

LCS Dup (B9F0193-BSD1)

Prepared: 06/11/19 12:25 Analyzed: 06/11/19 12:25

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Tetrachloroethene		10	1.0	ug/L	10		104	70-130	3	30
Tetrahydrofuran (THF)		93	10	ug/L	100		93	70-130	0.1	30
Toluene		10	1.0	ug/L	10		104	70-130	0.2	30
trans-1,2-Dichloroethene		11	1.0	ug/L	10		107	70-130	2	30
trans-1,3-Dichloropropene		10	0.50	ug/L	10		100	70-130	0.6	30
Trichloroethene (TCE)		11	0.10	ug/L	10		106	70-130	2	30
Trichlorofluoromethane		11	1.0	ug/L	10		105	70-130	3	30
Vinyl chloride		9.4	0.050	ug/L	10		94	70-130	0.1	30

Duplicate (B9F0193-DUP1)

Source: 19F0332-02

Prepared: 06/11/19 15:39 Analyzed: 06/11/19 15:39

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		100	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	10					
1,1,1,2-Tetrachloroethane		<	1.0	ug/L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,1,2,2-Tetrachloroethane		<	0.50	ug/L		<				30
1,1,2-Trichloroethane		<	0.50	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	0.20	ug/L		<				30
1,2,4-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	1.0	ug/L		<				30
1,2-Dibromoethane (EDB)		<	0.50	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	0.20	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

Duplicate (B9F0193-DUP1)

Source: 19F0332-02

Prepared: 06/11/19 15:39 Analyzed: 06/11/19 15:39

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,3-Dichloropropane		<	1.0	ug/L		<				30
1,4-Dichlorobenzene		<	1.0	ug/L		<				30
2,2-Dichloropropane		<	1.0	ug/L		<				30
2-Chlorotoluene		<	1.0	ug/L		<				30
4-Chlorotoluene		<	1.0	ug/L		<				30
Acetone		<	20	ug/L		<				30
Allyl chloride		<	1.0	ug/L		<				30
Benzene		<	0.50	ug/L		<				30
Bromobenzene		<	1.0	ug/L		<				30
Bromochloromethane		<	1.0	ug/L		<				30
Bromodichloromethane		<	1.0	ug/L		<				30
Bromoform		<	1.0	ug/L		<				30
Bromomethane		<	2.0	ug/L		<				30
Carbon tetrachloride		<	0.20	ug/L		<				30
Chlorobenzene		<	1.0	ug/L		<				30
Chlorodibromomethane		<	0.50	ug/L		<				30
Chloroethane		<	1.0	ug/L		<				30
Chloroform		<	1.0	ug/L		<				30
Chloromethane		<	1.0	ug/L		<				30
cis-1,2-Dichloroethene		<	1.0	ug/L		<				30
cis-1,3-Dichloropropene		<	0.50	ug/L		<				30
Dibromomethane		<	1.0	ug/L		<				30
Dichlorodifluoromethane		<	1.0	ug/L		<				30
Dichlorofluoromethane		<	1.0	ug/L		<				30
Ethyl ether		<	1.0	ug/L		<				30
Ethylbenzene		<	1.0	ug/L		<				30
Hexachlorobutadiene		<	0.50	ug/L		<				30
Isopropylbenzene		<	1.0	ug/L		<				30
Methyl ethyl ketone (MEK)		<	10	ug/L		<				30
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				30
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L		<				30
Methylene chloride		<	1.0	ug/L		<				30
Naphthalene		<	1.0	ug/L		<				30
n-Butylbenzene		<	1.0	ug/L		<				30
n-Propylbenzene		<	1.0	ug/L		<				30

FINAL REPORT

Report ID: 06202019 91932

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

Duplicate (B9F0193-DUP1)

Source: 19F0332-02

Prepared: 06/11/19 15:39 Analyzed: 06/11/19 15:39

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
o-Xylene		<	1.0	ug/L		<				30
p&m-Xylene		<	1.0	ug/L		<				30
p-Isopropyltoluene		<	1.0	ug/L		<				30
sec-Butylbenzene		<	1.0	ug/L		<				30
Styrene		<	1.0	ug/L		<				30
tert-Butylbenzene		<	1.0	ug/L		<				30
Tetrachloroethene		<	1.0	ug/L		<				30
Tetrahydrofuran (THF)		<	10	ug/L		<				30
Toluene		<	1.0	ug/L		<				30
trans-1,2-Dichloroethene		<	1.0	ug/L		<				30
trans-1,3-Dichloropropene		<	0.50	ug/L		<				30
Trichloroethene (TCE)		<	0.10	ug/L		<				30
Trichlorofluoromethane		<	1.0	ug/L		<				30
Vinyl chloride		<	0.050	ug/L		<				30

Matrix Spike (B9F0193-MS1)

Source: 19F0332-01

Prepared: 06/11/19 12:53 Analyzed: 06/11/19 12:53

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Surrogate: 1,2-Dichlorobenzene-d4		98	70-130	%	10					
Surrogate: 4-Bromofluorobenzene		100	70-130	%	10					
Surrogate: Methyl tertiary butyl ether-d3		98	70-130	%	10					
1,1,1,2-Tetrachloroethane		10	1.0	ug/L	10	<	104	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10	<	114	70-130		
1,1,2,2-Tetrachloroethane		9.8	0.50	ug/L	10	<	98	70-130		
1,1,2-Trichloroethane		9.9	0.50	ug/L	10	<	99	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10	<	118	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10	<	112	70-130		
1,1-Dichloroethene		12	1.0	ug/L	10	<	118	70-130		
1,1-Dichloropropene		12	1.0	ug/L	10	<	117	70-130		
1,2,3-Trichlorobenzene		11	1.0	ug/L	10	<	105	70-130		
1,2,3-Trichloropropane		9.6	0.20	ug/L	10	<	96	70-130		
1,2,4-Trichlorobenzene		11	1.0	ug/L	10	<	106	70-130		
1,2,4-Trimethylbenzene		11	1.0	ug/L	10	<	114	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		10	1.0	ug/L	10	<	100	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

Matrix Spike (B9F0193-MS1)

Source: 19F0332-01

Prepared: 06/11/19 12:53 Analyzed: 06/11/19 12:53

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)		10	0.50	ug/L	10	<	103	70-130		
1,2-Dichlorobenzene		10	1.0	ug/L	10	<	104	70-130		
1,2-Dichloroethane		10	0.20	ug/L	10	<	101	70-130		
1,2-Dichloropropane		10	1.0	ug/L	10	<	104	70-130		
1,3,5-Trimethylbenzene		11	1.0	ug/L	10	<	114	70-130		
1,3-Dichlorobenzene		11	1.0	ug/L	10	<	105	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10	<	103	70-130		
1,4-Dichlorobenzene		11	1.0	ug/L	10	<	108	70-130		
2,2-Dichloropropane		12	1.0	ug/L	10	<	123	70-130		
2-Chlorotoluene		11	1.0	ug/L	10	<	113	70-130		
4-Chlorotoluene		11	1.0	ug/L	10	<	112	70-130		
Acetone		96	20	ug/L	100	<	96	70-130		
Allyl chloride		9.7	1.0	ug/L	10	<	97	70-130		
Benzene		11	0.50	ug/L	10	<	111	70-130		
Bromobenzene		10	1.0	ug/L	10	<	102	70-130		
Bromochloromethane		11	1.0	ug/L	10	<	109	70-130		
Bromodichloromethane		11	1.0	ug/L	10	<	108	70-130		
Bromoform		10	1.0	ug/L	10	<	103	70-130		
Bromomethane		9.2	2.0	ug/L	10	<	92	70-130		
Carbon tetrachloride		12	0.20	ug/L	10	<	117	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	108	70-130		
Chlorodibromomethane		10	0.50	ug/L	10	<	105	70-130		
Chloroethane		11	1.0	ug/L	10	<	112	70-130		
Chloroform		11	1.0	ug/L	10	<	110	70-130		
Chloromethane		9.8	1.0	ug/L	10	<	98	70-130		
cis-1,2-Dichloroethene		11	1.0	ug/L	10	<	109	70-130		
cis-1,3-Dichloropropene		8.9	0.50	ug/L	10	<	89	70-130		
Dibromomethane		10	1.0	ug/L	10	<	101	70-130		
Dichlorodifluoromethane		10	1.0	ug/L	10	<	100	70-130		
Dichlorofluoromethane		12	1.0	ug/L	10	<	115	70-130		
Ethyl ether		11	1.0	ug/L	10	<	106	70-130		
Ethylbenzene		11	1.0	ug/L	10	<	112	70-130		
Hexachlorobutadiene		12	0.50	ug/L	10	<	120	70-130		
Isopropylbenzene		12	1.0	ug/L	10	<	118	70-130		
Methyl ethyl ketone (MEK)		51	10	ug/L	50	<	102	70-130		

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 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0193 - EPA 5030B Preparation

Matrix Spike (B9F0193-MS1)

Source: 19F0332-01

Prepared: 06/11/19 12:53 Analyzed: 06/11/19 12:53

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Methyl isobutyl ketone (MIBK)		55	5.0	ug/L	50	<	109	70-130		
Methyl tertiary butyl ether (MTBE)		10	2.0	ug/L	10	<	103	70-130		
Methylene chloride		10	1.0	ug/L	10	<	105	70-130		
Naphthalene		10	1.0	ug/L	10	<	104	70-130		
n-Butylbenzene		12	1.0	ug/L	10	<	118	70-130		
n-Propylbenzene		12	1.0	ug/L	10	<	116	70-130		
o-Xylene		11	1.0	ug/L	10	<	112	70-130		
p&m-Xylene		12	1.0	ug/L	10	<	116	70-130		
p-Isopropyltoluene		12	1.0	ug/L	10	<	118	70-130		
sec-Butylbenzene		12	1.0	ug/L	10	<	120	70-130		
Styrene		11	1.0	ug/L	10	<	108	70-130		
tert-Butylbenzene		12	1.0	ug/L	10	<	116	70-130		
Tetrachloroethene		12	1.0	ug/L	10	<	115	70-130		
Tetrahydrofuran (THF)		94	10	ug/L	100	<	94	70-130		
Toluene		11	1.0	ug/L	10	<	112	70-130		
trans-1,2-Dichloroethene		11	1.0	ug/L	10	<	113	70-130		
trans-1,3-Dichloropropene		8.6	0.50	ug/L	10	<	86	70-130		
Trichloroethene (TCE)		11	0.10	ug/L	10	<	114	70-130		
Trichlorofluoromethane		11	1.0	ug/L	10	<	113	70-130		
Vinyl chloride		10	0.050	ug/L	10	<	104	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0164 - 1,4 Dioxane in Water SPE

Blank (B9F0164-BLK1)				Prepared: 06/10/19 08:00 Analyzed: 06/17/19 11:47						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		<	0.050	ug/L						

LCS (B9F0164-BS1)				Prepared: 06/10/19 08:00 Analyzed: 06/17/19 12:04						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.22	0.052	ug/L	0.20		107	80-120		

Duplicate (B9F0164-DUP2)				Source: 19F0032-08RE1 Prepared: 06/10/19 08:00 Analyzed: 06/18/19 10:09						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane	D2	13	0.20	ug/L		12			8	30

Matrix Spike (B9F0164-MS1)				Source: 19F0227-07 Prepared: 06/10/19 08:00 Analyzed: 06/17/19 16:45						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,4-Dioxane		0.73	0.051	ug/L	0.45	0.17	122	70-130		

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0100 - PFCs Preparation

Blank (B9F0100-BLK1)

Prepared: 06/06/19 14:16 Analyzed: 06/06/19 14:16

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9F0100-BLK2)

Prepared: 06/06/19 17:19 Analyzed: 06/06/19 17:19

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9F0100-BS1)

Prepared: 06/06/19 14:07 Analyzed: 06/06/19 14:07

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50		102	80-120		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5		102	80-120		
Perfluorohexanesulfonate (PFHxS)		0.48	0.025	ug/L	0.50		95	80-120		
Perfluorohexanoic acid (PFHxA)		0.52	0.050	ug/L	0.5		104	80-120		
Perfluorooctanesulfonate (PFOS)		0.52	0.015	ug/L	0.49		105	80-120		
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5		106	80-120		
Perfluoropentanoic acid (PFPeA)		0.49	0.050	ug/L	0.5		98	80-120		

LCS Dup (B9F0100-BSD1)

Prepared: 06/06/19 17:11 Analyzed: 06/06/19 17:11

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.50	0.050	ug/L	0.50		99	80-120	3	20
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5		103	80-120	1	20
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50		101	80-120	6	20

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0100 - PFCs Preparation

LCS Dup (B9F0100-BSD1)

Prepared: 06/06/19 17:11 Analyzed: 06/06/19 17:11

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)		0.50	0.050	ug/L	0.5		99	80-120	5	20
Perfluorooctanesulfonate (PFOS)		0.53	0.015	ug/L	0.49		106	80-120	0.8	20
Perfluorooctanoic acid (PFOA)		0.53	0.035	ug/L	0.5		106	80-120	0.4	20
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5		101	80-120	3	20

Matrix Spike (B9F0100-MS1)

Source: 19F0051-02

Prepared: 06/06/19 14:32 Analyzed: 06/06/19 14:32

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	102	70-130		
Perfluorobutanoic acid (PFBA)		0.53	0.050	ug/L	0.5	<	105	70-130		
Perfluorohexanesulfonate (PFHxS)		0.50	0.025	ug/L	0.50	<	99	70-130		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5	<	98	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.015	ug/L	0.49	<	102	70-130		
Perfluorooctanoic acid (PFOA)		0.54	0.035	ug/L	0.5	<	107	70-130		
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	102	70-130		

Matrix Spike Dup (B9F0100-MSD1)

Source: 19F0051-02

Prepared: 06/06/19 14:41 Analyzed: 06/06/19 14:41

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	106	70-130	4	20
Perfluorobutanoic acid (PFBA)		0.52	0.050	ug/L	0.5	<	104	70-130	1	20
Perfluorohexanesulfonate (PFHxS)		0.49	0.025	ug/L	0.50	<	97	70-130	2	20
Perfluorohexanoic acid (PFHxA)		0.54	0.050	ug/L	0.5	<	109	70-130	10	20
Perfluorooctanesulfonate (PFOS)		0.52	0.015	ug/L	0.49	<	104	70-130	2	20
Perfluorooctanoic acid (PFOA)		0.52	0.035	ug/L	0.5	<	103	70-130	4	20
Perfluoropentanoic acid (PFPeA)		0.51	0.050	ug/L	0.5	<	101	70-130	1	20

Batch B9F0167 - PFCs Preparation

Blank (B9F0167-BLK1)

Prepared: 06/10/19 10:58 Analyzed: 06/10/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						

FINAL REPORT

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Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0167 - PFCs Preparation

Blank (B9F0167-BLK1)

Prepared: 06/10/19 10:58 Analyzed: 06/10/19 10:58

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

Blank (B9F0167-BLK2)

Prepared: 06/10/19 14:18 Analyzed: 06/10/19 14:18

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		<	0.050	ug/L						
Perfluorobutanoic acid (PFBA)		<	0.050	ug/L						
Perfluorohexanesulfonate (PFHxS)		<	0.025	ug/L						
Perfluorohexanoic acid (PFHxA)		<	0.050	ug/L						
Perfluorooctanesulfonate (PFOS)		<	0.015	ug/L						
Perfluorooctanoic acid (PFOA)		<	0.035	ug/L						
Perfluoropentanoic acid (PFPeA)		<	0.050	ug/L						

LCS (B9F0167-BS1)

Prepared: 06/10/19 10:50 Analyzed: 06/10/19 10:50

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50		101	80-120		
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5		98	80-120		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50		103	80-120		
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5		96	80-120		
Perfluorooctanesulfonate (PFOS)		0.51	0.015	ug/L	0.49		102	80-120		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5		99	80-120		
Perfluoropentanoic acid (PFPeA)		0.49	0.050	ug/L	0.5		97	80-120		

LCS Dup (B9F0167-BSD1)

Prepared: 06/10/19 14:09 Analyzed: 06/10/19 14:09

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50		106	80-120	5	20
Perfluorobutanoic acid (PFBA)		0.50	0.050	ug/L	0.5		100	80-120	2	20
Perfluorohexanesulfonate (PFHxS)		0.52	0.025	ug/L	0.50		105	80-120	2	20
Perfluorohexanoic acid (PFHxA)		0.51	0.050	ug/L	0.5		101	80-120	5	20
Perfluorooctanesulfonate (PFOS)		0.52	0.015	ug/L	0.49		104	80-120	2	20
Perfluorooctanoic acid (PFOA)		0.49	0.035	ug/L	0.5		98	80-120	1	20
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5		100	80-120	3	20

FINAL REPORT

Report ID: 06202019 91932

Authorized by:

The results in this report apply only to the samples analyzed.
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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
 Quality Control

Program Code: QW	Project ID: PRJ07786
Program Name: Closed Landfill Assessment	Facility Name/ID: MN SW-057
Collected By: David Anderson	City: 19-01567 MPCA Freeway Landfill 2019 MDH
Collector ID: None	Generated: 06/20/19 9:19

Results were produced by Minnesota Department of Health, except where noted.

Batch B9F0167 - PFCs Preparation

Matrix Spike (B9F0167-MS1) Source: 19F0324-01 Prepared: 06/10/19 12:30 Analyzed: 06/10/19 12:30

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.53	0.050	ug/L	0.50	<	105	70-130		
Perfluorobutanoic acid (PFBA)		0.51	0.050	ug/L	0.5	<	102	70-130		
Perfluorohexanesulfonate (PFHxS)		0.51	0.025	ug/L	0.50	<	103	70-130		
Perfluorohexanoic acid (PFHxA)		0.49	0.050	ug/L	0.5	<	98	70-130		
Perfluorooctanesulfonate (PFOS)		0.51	0.015	ug/L	0.49	<	101	70-130		
Perfluorooctanoic acid (PFOA)		0.50	0.035	ug/L	0.5	<	101	70-130		
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5	<	101	70-130		

Matrix Spike Dup (B9F0167-MSD1) Source: 19F0324-01 Prepared: 06/10/19 12:38 Analyzed: 06/10/19 12:38

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Perfluorobutanesulfonate (PFBS)		0.51	0.050	ug/L	0.50	<	101	70-130	3	20
Perfluorobutanoic acid (PFBA)		0.49	0.050	ug/L	0.5	<	98	70-130	4	20
Perfluorohexanesulfonate (PFHxS)		0.53	0.025	ug/L	0.50	<	106	70-130	3	20
Perfluorohexanoic acid (PFHxA)		0.48	0.050	ug/L	0.5	<	95	70-130	2	20
Perfluorooctanesulfonate (PFOS)		0.52	0.015	ug/L	0.49	<	103	70-130	2	20
Perfluorooctanoic acid (PFOA)		0.48	0.035	ug/L	0.5	<	96	70-130	5	20
Perfluoropentanoic acid (PFPeA)		0.50	0.050	ug/L	0.5	<	100	70-130	0.6	20

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
 Public Health Laboratory, Minnesota Department of Health

Final Report
Quality Control

Data Qualifiers and Definitions

J	Analyte was present between the method detection limit and reporting limit and should be considered an estimated value.
D2	Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
D1	Sample required dilution due to matrix. Reporting limit has been raised.
Dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%REC	Percent Recovery

Authorized by:

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Paul Moyer, Environmental Laboratory Manager
Public Health Laboratory, Minnesota Department of Health

April 17, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468315

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 26, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas DW Certification #: MN00064
 Arkansas WW Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064
 Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
 Minnesota Petrofund Certification #: 1240
 Mississippi Certification #: MN00064
 Missouri Certification #: 10100
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon Primary Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Vermont Certification #: VT-027053137
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DEP Certification #: 382
 West Virginia DW Certification #: 9952 C
 Wisconsin Certification #: 999407970
 Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 Montana Certificate #CERT0103
 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad
 Florida/TNI Certification #: E87683

Georgia Certification #: C040
 Guam Certification
 Florida: Cert E871149 SEKS WET
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133
 KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10468315001	Field Blank 1	Water	03/26/19 10:10	03/26/19 17:05
10468315002	603281	Water	03/26/19 11:30	03/26/19 17:05
10468315003	603287	Water	03/26/19 13:50	03/26/19 17:05
10468315004	603288	Water	03/26/19 15:30	03/26/19 17:05
10468315005	603289	Water	03/26/19 16:30	03/26/19 17:05

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10468315001	Field Blank 1	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	AT1	38	PASI-M
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10468315002	603281	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	AT1	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10468315003	603287	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	AT1	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10468315004	603288	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	AT1	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10468315005	603289	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	AT1	38	PASI-M
			CLJ	15	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: Field Blank 1		Lab ID: 10468315001	Collected: 03/26/19 10:10	Received: 03/26/19 17:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:09	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	62	%	30-125	1	03/27/19 10:59	03/29/19 09:09	877-09-8	
Decachlorobiphenyl (S)	66	%	30-125	1	03/27/19 10:59	03/29/19 09:09	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/27/19 07:40	04/01/19 13:01	7429-90-5	
Barium, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:01	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:01	7440-50-8	
Manganese, Dissolved	ND	ug/L	5.0	1	03/27/19 07:40	04/01/19 13:01	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:01	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:01	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/27/19 07:40	04/01/19 13:01	7440-31-5	
Total Hardness by 2340B, Dissolved	ND	ug/L	3300	1	03/27/19 07:40	04/01/19 13:01		
Zinc, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:01	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:24	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:24	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/27/19 07:40	04/02/19 10:24	7440-41-7	
Boron, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/02/19 10:24	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/27/19 07:40	04/02/19 10:24	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:24	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:24	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/27/19 07:40	04/02/19 10:24	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:24	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/27/19 07:40	04/02/19 10:24	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:24	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/27/19 07:40	04/02/19 10:24	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	83-32-9	
Anthracene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	50-32-8	
Benzoic acid	ND	ug/L	51.3	1	03/26/19 18:40	03/28/19 18:00	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: Field Blank 1		Lab ID: 10468315001	Collected: 03/26/19 10:10	Received: 03/26/19 17:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
2-Chlorophenol	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.3	1	03/26/19 18:40	03/28/19 18:00	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	120-83-2	
Diethylphthalate	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	105-67-9	
Dimethylphthalate	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	117-81-7	
Fluoranthene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	206-44-0	
Fluorene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	86-73-7	
Hexachlorobenzene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.3	1	03/26/19 18:40	03/28/19 18:00	77-47-4	
Hexachloroethane	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	67-72-1	
Isophorone	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.5	1	03/26/19 18:40	03/28/19 18:00		
N-Nitrosodimethylamine	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	62-75-9	
Pentachlorophenol	ND	ug/L	20.5	1	03/26/19 18:40	03/28/19 18:00	87-86-5	
Phenanthrene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	85-01-8	
Phenol	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	108-95-2	
Pyrene	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	03/26/19 18:40	03/28/19 18:00	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	73	%.	55-125	1	03/26/19 18:40	03/28/19 18:00	4165-60-0	
2-Fluorobiphenyl (S)	70	%.	52-125	1	03/26/19 18:40	03/28/19 18:00	321-60-8	
p-Terphenyl-d14 (S)	81	%.	57-125	1	03/26/19 18:40	03/28/19 18:00	1718-51-0	
Phenol-d6 (S)	69	%.	30-125	1	03/26/19 18:40	03/28/19 18:00	13127-88-3	
2-Fluorophenol (S)	66	%.	30-125	1	03/26/19 18:40	03/28/19 18:00	367-12-4	
2,4,6-Tribromophenol (S)	85	%.	52-125	1	03/26/19 18:40	03/28/19 18:00	118-79-6	
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	ND	mg/L	1.2	1		03/28/19 03:20	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/27/19 08:40		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	ND	mg/L	0.11	1	04/02/19 10:00	04/03/19 10:59	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/02/19 10:26	04/02/19 13:02	57-12-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603281	Lab ID: 10468315002	Collected: 03/26/19 11:30	Received: 03/26/19 17:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:24	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	26	%	30-125	1	03/27/19 10:59	03/29/19 09:24	877-09-8	S0
Decachlorobiphenyl (S)	55	%	30-125	1	03/27/19 10:59	03/29/19 09:24	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/27/19 07:40	04/01/19 13:03	7429-90-5	
Barium, Dissolved	28.6	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:03	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:03	7440-50-8	
Manganese, Dissolved	75.2	ug/L	5.0	1	03/27/19 07:40	04/01/19 13:03	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:03	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:03	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/27/19 07:40	04/01/19 13:03	7440-31-5	
Total Hardness by 2340B, Dissolved	801000	ug/L	3300	1	03/27/19 07:40	04/01/19 13:03		
Zinc, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:03	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:28	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:28	7440-38-2	
Beryllium, Dissolved	0.24	ug/L	0.20	1	03/27/19 07:40	04/02/19 10:28	7440-41-7	
Boron, Dissolved	30100	ug/L	2000	200	03/27/19 07:40	04/03/19 08:28	7440-42-8	M6
Cadmium, Dissolved	ND	ug/L	0.080	1	03/27/19 07:40	04/02/19 10:28	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:28	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:28	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/27/19 07:40	04/02/19 10:28	7439-92-1	
Selenium, Dissolved	22.9	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:28	7782-49-2	
Thallium, Dissolved	0.42	ug/L	0.10	1	03/27/19 07:40	04/02/19 10:28	7440-28-0	
Uranium-238, Dissolved	12.7	ug/L	0.50	1	03/27/19 07:40	04/02/19 10:28	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/27/19 07:40	04/02/19 10:28	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	83-32-9	
Anthracene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	50-32-8	
Benzoic acid	ND	ug/L	52.6	1	03/26/19 18:40	03/28/19 18:25	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603281 **Lab ID: 10468315002** Collected: 03/26/19 11:30 Received: 03/26/19 17:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.6	1	03/26/19 18:40	03/28/19 18:25	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	120-83-2	
Diethylphthalate	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	105-67-9	
Dimethylphthalate	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	117-81-7	
Fluoranthene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	206-44-0	
Fluorene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	86-73-7	
Hexachlorobenzene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.6	1	03/26/19 18:40	03/28/19 18:25	77-47-4	
Hexachloroethane	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	67-72-1	
Isophorone	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	21.1	1	03/26/19 18:40	03/28/19 18:25		
N-Nitrosodimethylamine	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	62-75-9	
Pentachlorophenol	ND	ug/L	21.1	1	03/26/19 18:40	03/28/19 18:25	87-86-5	
Phenanthrene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	85-01-8	
Phenol	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	108-95-2	
Pyrene	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.5	1	03/26/19 18:40	03/28/19 18:25	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%.	55-125	1	03/26/19 18:40	03/28/19 18:25	4165-60-0	
2-Fluorobiphenyl (S)	76	%.	52-125	1	03/26/19 18:40	03/28/19 18:25	321-60-8	
p-Terphenyl-d14 (S)	82	%.	57-125	1	03/26/19 18:40	03/28/19 18:25	1718-51-0	
Phenol-d6 (S)	75	%.	30-125	1	03/26/19 18:40	03/28/19 18:25	13127-88-3	
2-Fluorophenol (S)	72	%.	30-125	1	03/26/19 18:40	03/28/19 18:25	367-12-4	
2,4,6-Tribromophenol (S)	87	%.	52-125	1	03/26/19 18:40	03/28/19 18:25	118-79-6	

Field Data

Analytical Method:

Field pH	6.8	Std. Units		1		03/26/19 11:30		
Field Temperature	10.0	deg C		1		03/26/19 11:30		
Collected Date	03/26/19			1		04/17/19 14:22		
Collected Time	1130			1		04/17/19 14:22		
Field Specific Conductance	1810	umhos/cm		1		04/17/19 14:22		
Oxygen, Dissolved	1.1	mg/L		1		04/17/19 14:22	7782-44-7	
REDOX	80	mV		1		04/17/19 14:22		
Turbidity	54.7	NTU		1		04/17/19 14:22		
Apparent Color	slightly cloudy			1		04/17/19 14:22		
Odor	No			1		04/17/19 14:22		
Well Locked	Yes			1		04/17/19 14:22		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603281		Lab ID: 10468315002		Collected: 03/26/19 11:30	Received: 03/26/19 17:05	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Purge Method	Peristaltic pump			1		04/17/19 14:22		
Total Well Depth	32.91	feet		1		04/17/19 14:22		
Depth of Water	18.74			1		04/17/19 14:22		
Well Volume Purged	6.0			1		04/17/19 14:22		
Purge Rate	0.3			1		04/17/19 14:22		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	81.6	mg/L	6.0	5		03/28/19 07:12	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/27/19 08:40		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/17/19 14:24		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	ND	mg/L	0.11	1	04/02/19 10:00	04/03/19 11:00	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:13	57-12-5	

Sample: 603287		Lab ID: 10468315003		Collected: 03/26/19 13:50	Received: 03/26/19 17:05	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 09:39	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	56	%	30-125	1	03/27/19 10:59	03/29/19 09:39	877-09-8	
Decachlorobiphenyl (S)	73	%	30-125	1	03/27/19 10:59	03/29/19 09:39	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/27/19 07:40	04/01/19 13:05	7429-90-5	
Barium, Dissolved	266	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:05	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:05	7440-50-8	
Manganese, Dissolved	1150	ug/L	5.0	1	03/27/19 07:40	04/01/19 13:05	7439-96-5	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603287	Lab ID: 10468315003	Collected: 03/26/19 13:50	Received: 03/26/19 17:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Nickel, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:05	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:05	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/27/19 07:40	04/01/19 13:05	7440-31-5	
Total Hardness by 2340B, Dissolved	679000	ug/L	3300	1	03/27/19 07:40	04/01/19 13:05		
Zinc, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:05	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:04	7440-36-0	
Arsenic, Dissolved	2.6	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:04	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/27/19 07:40	04/02/19 11:04	7440-41-7	
Boron, Dissolved	526	ug/L	50.0	5	03/27/19 07:40	04/03/19 08:19	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/27/19 07:40	04/02/19 11:04	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:04	7440-47-3	
Cobalt, Dissolved	4.8	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:04	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/27/19 07:40	04/02/19 11:04	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:04	7782-49-2	
Thallium, Dissolved	0.28	ug/L	0.10	1	03/27/19 07:40	04/02/19 11:04	7440-28-0	
Uranium-238, Dissolved	2.4	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:04	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/27/19 07:40	04/02/19 11:04	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	83-32-9	
Anthracene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	50-32-8	
Benzoic acid	ND	ug/L	50.0	1	03/26/19 18:40	03/28/19 18:49	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	111-44-4	
2-Chlorophenol	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	50.0	1	03/26/19 18:40	03/28/19 18:49	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	120-83-2	
Diethylphthalate	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	105-67-9	
Dimethylphthalate	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	117-81-7	
Fluoranthene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	206-44-0	
Fluorene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	86-73-7	
Hexachlorobenzene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	50.0	1	03/26/19 18:40	03/28/19 18:49	77-47-4	
Hexachloroethane	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	67-72-1	
Isophorone	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603287	Lab ID: 10468315003	Collected: 03/26/19 13:50	Received: 03/26/19 17:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.0	1	03/26/19 18:40	03/28/19 18:49		
N-Nitrosodimethylamine	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	62-75-9	
Pentachlorophenol	ND	ug/L	20.0	1	03/26/19 18:40	03/28/19 18:49	87-86-5	
Phenanthrene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	85-01-8	
Phenol	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	108-95-2	
Pyrene	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.0	1	03/26/19 18:40	03/28/19 18:49	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	76	%	55-125	1	03/26/19 18:40	03/28/19 18:49	4165-60-0	
2-Fluorobiphenyl (S)	77	%	52-125	1	03/26/19 18:40	03/28/19 18:49	321-60-8	
p-Terphenyl-d14 (S)	80	%	57-125	1	03/26/19 18:40	03/28/19 18:49	1718-51-0	
Phenol-d6 (S)	74	%	30-125	1	03/26/19 18:40	03/28/19 18:49	13127-88-3	
2-Fluorophenol (S)	71	%	30-125	1	03/26/19 18:40	03/28/19 18:49	367-12-4	
2,4,6-Tribromophenol (S)	90	%	52-125	1	03/26/19 18:40	03/28/19 18:49	118-79-6	
Field Data								
Analytical Method:								
Field pH	6.7	Std. Units		1		03/26/19 13:50		
Field Temperature	11.5	deg C		1		03/26/19 13:50		
Collected Date	03/26/19			1		03/26/19 13:50		
Collected Time	1350			1		03/26/19 13:50		
Field Specific Conductance	1850	umhos/cm		1		03/26/19 13:50		
Oxygen, Dissolved	1.5	mg/L		1		03/26/19 13:50	7782-44-7	
REDOX	-29	mV		1		03/26/19 13:50		
Turbidity	19.5	NTU		1		03/26/19 13:50		
Apparent Color	clear			1		03/26/19 13:50		
Odor	No			1		03/26/19 13:50		
Well Locked	Yes			1		03/26/19 13:50		
Purge Method	Whale pump			1		03/26/19 13:50		
Total Well Depth	29.53	feet		1		03/26/19 13:50		
Depth of Water	11.27			1		03/26/19 13:50		
Well Volume Purged	81.0			1		03/26/19 13:50		
Purge Rate	1.0			1		03/26/19 13:50		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	279	mg/L	6.0	5		03/28/19 07:29	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/27/19 08:40		
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/17/19 14:26		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	0.81	mg/L	0.11	1	04/02/19 10:00	04/03/19 11:02	7664-41-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603287	Lab ID: 10468315003	Collected: 03/26/19 13:50	Received: 03/26/19 17:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

SM4500CN-E Cyanide Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E

Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:17	57-12-5	
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Sample: 603288	Lab ID: 10468315004	Collected: 03/26/19 15:30	Received: 03/26/19 17:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C

PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/27/19 10:59	03/29/19 09:54	11100-14-4	

Surrogates

Tetrachloro-m-xylene (S)	47	%	30-125	1	03/27/19 10:59	03/29/19 09:54	877-09-8	
Decachlorobiphenyl (S)	69	%	30-125	1	03/27/19 10:59	03/29/19 09:54	2051-24-3	

200.7 MET ICP, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7

Aluminum, Dissolved	ND	ug/L	200	1	03/27/19 07:40	04/01/19 13:10	7429-90-5	
Barium, Dissolved	122	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:10	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:10	7440-50-8	
Manganese, Dissolved	1490	ug/L	5.0	1	03/27/19 07:40	04/01/19 13:10	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:10	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:10	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/27/19 07:40	04/01/19 13:10	7440-31-5	
Total Hardness by 2340B, Dissolved	772000	ug/L	3300	1	03/27/19 07:40	04/01/19 13:10		
Zinc, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:10	7440-66-6	

200.8 MET ICPMS, Dissolved Analytical Method: EPA 200.8 Preparation Method: EPA 200.8

Antimony, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:12	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:12	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/27/19 07:40	04/02/19 11:12	7440-41-7	
Boron, Dissolved	901	ug/L	50.0	5	03/27/19 07:40	04/03/19 08:24	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/27/19 07:40	04/02/19 11:12	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:12	7440-47-3	
Cobalt, Dissolved	6.3	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:12	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/27/19 07:40	04/02/19 11:12	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:12	7782-49-2	
Thallium, Dissolved	1.2	ug/L	0.10	1	03/27/19 07:40	04/02/19 11:12	7440-28-0	
Uranium-238, Dissolved	6.9	ug/L	0.50	1	03/27/19 07:40	04/02/19 11:12	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/27/19 07:40	04/02/19 11:12	7440-62-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603288	Lab ID: 10468315004	Collected: 03/26/19 15:30	Received: 03/26/19 17:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	83-32-9	
Anthracene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	50-32-8	
Benzoic acid	ND	ug/L	48.5	1	03/26/19 18:40	03/28/19 19:14	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	111-44-4	
2-Chlorophenol	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.5	1	03/26/19 18:40	03/28/19 19:14	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	120-83-2	
Diethylphthalate	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	105-67-9	
Dimethylphthalate	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	117-81-7	
Fluoranthene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	206-44-0	
Fluorene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	86-73-7	
Hexachlorobenzene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.5	1	03/26/19 18:40	03/28/19 19:14	77-47-4	
Hexachloroethane	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	67-72-1	
Isophorone	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.4	1	03/26/19 18:40	03/28/19 19:14		
N-Nitrosodimethylamine	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	62-75-9	
Pentachlorophenol	ND	ug/L	19.4	1	03/26/19 18:40	03/28/19 19:14	87-86-5	
Phenanthrene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	85-01-8	
Phenol	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	108-95-2	
Pyrene	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.7	1	03/26/19 18:40	03/28/19 19:14	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	79	%	55-125	1	03/26/19 18:40	03/28/19 19:14	4165-60-0	
2-Fluorobiphenyl (S)	78	%	52-125	1	03/26/19 18:40	03/28/19 19:14	321-60-8	
p-Terphenyl-d14 (S)	83	%	57-125	1	03/26/19 18:40	03/28/19 19:14	1718-51-0	
Phenol-d6 (S)	75	%	30-125	1	03/26/19 18:40	03/28/19 19:14	13127-88-3	
2-Fluorophenol (S)	71	%	30-125	1	03/26/19 18:40	03/28/19 19:14	367-12-4	
2,4,6-Tribromophenol (S)	90	%	52-125	1	03/26/19 18:40	03/28/19 19:14	118-79-6	

Field Data

Analytical Method:

Collected Date	03/26/19		1	03/26/19 15:30
Collected Time	1530		1	03/26/19 15:30
Field Specific Conductance	2030	umhos/cm	1	03/26/19 15:30
Oxygen, Dissolved	1.0	mg/L	1	03/26/19 15:30 7782-44-7
REDOX	52	mV	1	03/26/19 15:30
Turbidity	52.4	NTU	1	03/26/19 15:30

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603288		Lab ID: 10468315004		Collected: 03/26/19 15:30	Received: 03/26/19 17:05	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Apparent Color	clear			1		03/26/19 15:30		
Odor	No			1		03/26/19 15:30		
Well Locked	Yes			1		03/26/19 15:30		
Purge Method	Whale pump			1		03/26/19 15:30		
Total Well Depth	28.54	feet		1		03/26/19 15:30		
Depth of Water	11.38			1		03/26/19 15:30		
Well Volume Purged	78.0			1		03/26/19 15:30		
Purge Rate	1.0			1		03/26/19 15:30		
Field pH	6.5	Std. Units		1		03/26/19 15:30		
Field Temperature	10.5	deg C		1		03/26/19 15:30		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	272	mg/L	6.0	5		03/28/19 07:47	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/27/19 08:40		M3
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/17/19 14:33		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	0.32	mg/L	0.11	1	04/02/19 10:00	04/03/19 11:03	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:17	57-12-5	

Sample: 603289		Lab ID: 10468315005		Collected: 03/26/19 16:30	Received: 03/26/19 17:05	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	03/27/19 10:59	03/29/19 10:10	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	74	%	30-125	1	03/27/19 10:59	03/29/19 10:10	877-09-8	
Decachlorobiphenyl (S)	88	%	30-125	1	03/27/19 10:59	03/29/19 10:10	2051-24-3	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603289		Lab ID: 10468315005	Collected: 03/26/19 16:30	Received: 03/26/19 17:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/27/19 07:40	04/01/19 13:11	7429-90-5	
Barium, Dissolved	130	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:11	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:11	7440-50-8	
Manganese, Dissolved	1760	ug/L	5.0	1	03/27/19 07:40	04/01/19 13:11	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:11	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/27/19 07:40	04/01/19 13:11	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/27/19 07:40	04/01/19 13:11	7440-31-5	
Total Hardness by 2340B, Dissolved	958000	ug/L	3300	1	03/27/19 07:40	04/01/19 13:11		
Zinc, Dissolved	ND	ug/L	20.0	1	03/27/19 07:40	04/01/19 13:11	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 12:01	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 12:01	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/27/19 07:40	04/02/19 12:01	7440-41-7	
Boron, Dissolved	13900	ug/L	1000	100	03/27/19 07:40	04/03/19 08:45	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/27/19 07:40	04/02/19 12:01	7440-43-9	
Chromium, Dissolved	0.60	ug/L	0.50	1	03/27/19 07:40	04/02/19 12:01	7440-47-3	
Cobalt, Dissolved	9.6	ug/L	0.50	1	03/27/19 07:40	04/02/19 12:01	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/27/19 07:40	04/02/19 12:01	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/27/19 07:40	04/02/19 12:01	7782-49-2	
Thallium, Dissolved	4.0	ug/L	0.10	1	03/27/19 07:40	04/02/19 12:01	7440-28-0	
Uranium-238, Dissolved	5.0	ug/L	0.50	1	03/27/19 07:40	04/02/19 12:01	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/27/19 07:40	04/02/19 12:01	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	83-32-9	
Anthracene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	50-32-8	
Benzoic acid	ND	ug/L	49.0	1	03/26/19 18:40	03/28/19 19:38	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	111-44-4	
2-Chlorophenol	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.0	1	03/26/19 18:40	03/28/19 19:38	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	206-44-0	
Fluorene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.0	1	03/26/19 18:40	03/28/19 19:38	77-47-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603289	Lab ID: 10468315005	Collected: 03/26/19 16:30	Received: 03/26/19 17:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Hexachloroethane	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	67-72-1	
Isophorone	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.6	1	03/26/19 18:40	03/28/19 19:38		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	62-75-9	
Pentachlorophenol	ND	ug/L	19.6	1	03/26/19 18:40	03/28/19 19:38	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	85-01-8	
Phenol	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	108-95-2	
Pyrene	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	03/26/19 18:40	03/28/19 19:38	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	80	%.	55-125	1	03/26/19 18:40	03/28/19 19:38	4165-60-0	
2-Fluorobiphenyl (S)	80	%.	52-125	1	03/26/19 18:40	03/28/19 19:38	321-60-8	
p-Terphenyl-d14 (S)	80	%.	57-125	1	03/26/19 18:40	03/28/19 19:38	1718-51-0	
Phenol-d6 (S)	77	%.	30-125	1	03/26/19 18:40	03/28/19 19:38	13127-88-3	
2-Fluorophenol (S)	71	%.	30-125	1	03/26/19 18:40	03/28/19 19:38	367-12-4	
2,4,6-Tribromophenol (S)	90	%.	52-125	1	03/26/19 18:40	03/28/19 19:38	118-79-6	
Field Data								
Analytical Method:								
Collected Date	03/26/19			1		03/26/19 16:30		
Collected Time	1630			1		03/26/19 16:30		
Field Specific Conductance	2700	umhos/cm		1		03/26/19 16:30		
Oxygen, Dissolved	0.9	mg/L		1		03/26/19 16:30	7782-44-7	
REDOX	3	mV		1		03/26/19 16:30		
Apparent Color	slightly cloudy			1		03/26/19 16:30		
Odor	No			1		03/26/19 16:30		
Well Locked	Yes			1		03/26/19 16:30		
Purge Method	Whale pump			1		03/26/19 16:30		
Total Well Depth	30.30	feet		1		03/26/19 16:30		
Depth of Water	20.98			1		03/26/19 16:30		
Well Volume Purged	42.0			1		03/26/19 16:30		
Purge Rate	1.0			1		03/26/19 16:30		
Field pH	6.9	Std. Units		1		03/26/19 16:30		
Field Temperature	13.0	deg C		1		03/26/19 16:30		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	291	mg/L	6.0	5		03/28/19 08:05	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/27/19 08:40		
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/17/19 14:35		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: 603289		Lab ID: 10468315005		Collected: 03/26/19 16:30	Received: 03/26/19 17:05	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	5.3	mg/L	0.11	1	04/02/19 10:00	04/03/19 11:04	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:21	57-12-5	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

QC Batch: 595875 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
 Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

METHOD BLANK: 3221700 Matrix: Water
 Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/01/19 12:58	
Barium, Dissolved	ug/L	ND	10.0	04/01/19 12:58	
Copper, Dissolved	ug/L	ND	10.0	04/01/19 12:58	
Manganese, Dissolved	ug/L	ND	5.0	04/01/19 12:58	
Nickel, Dissolved	ug/L	ND	20.0	04/01/19 12:58	
Silver, Dissolved	ug/L	ND	10.0	04/01/19 12:58	
Tin, Dissolved	ug/L	ND	75.0	04/01/19 12:58	
Zinc, Dissolved	ug/L	ND	20.0	04/01/19 12:58	

LABORATORY CONTROL SAMPLE: 3221701

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21900	110	85-115	
Barium, Dissolved	ug/L	1000	1060	106	85-115	
Copper, Dissolved	ug/L	1000	1000	100	85-115	
Manganese, Dissolved	ug/L	1000	1100	110	85-115	
Nickel, Dissolved	ug/L	1000	1040	104	85-115	
Silver, Dissolved	ug/L	500	527	105	85-115	
Tin, Dissolved	ug/L	1000	1050	105	85-115	
Zinc, Dissolved	ug/L	1000	1060	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3221702 3221703

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10468315003 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Aluminum, Dissolved	ug/L	ND	20000	20000	22800	22400	114	112	70-130	2	20
Barium, Dissolved	ug/L	266	1000	1000	1310	1330	104	106	70-130	2	20
Copper, Dissolved	ug/L	ND	1000	1000	1060	1060	106	106	70-130	0	20
Manganese, Dissolved	ug/L	1150	1000	1000	2190	2200	104	105	70-130	1	20
Nickel, Dissolved	ug/L	ND	1000	1000	1020	1020	102	101	70-130	0	20
Silver, Dissolved	ug/L	ND	500	500	557	555	111	111	70-130	0	20
Tin, Dissolved	ug/L	ND	1000	1000	1040	1030	104	103	70-130	1	20
Zinc, Dissolved	ug/L	ND	1000	1000	1010	1010	101	101	70-130	0	20

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

QC Batch: 595880 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

METHOD BLANK: 3221728 Matrix: Water
Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/02/19 10:11	
Arsenic, Dissolved	ug/L	ND	0.50	04/02/19 10:11	
Beryllium, Dissolved	ug/L	ND	0.20	04/02/19 10:11	
Boron, Dissolved	ug/L	ND	10.0	04/02/19 10:11	
Cadmium, Dissolved	ug/L	ND	0.080	04/02/19 10:11	
Chromium, Dissolved	ug/L	ND	0.50	04/02/19 10:11	
Cobalt, Dissolved	ug/L	ND	0.50	04/02/19 10:11	
Lead, Dissolved	ug/L	ND	0.10	04/02/19 10:11	
Selenium, Dissolved	ug/L	ND	0.50	04/02/19 10:11	
Thallium, Dissolved	ug/L	ND	0.10	04/02/19 10:11	
Uranium-238, Dissolved	ug/L	ND	0.50	04/02/19 10:11	
Vanadium, Dissolved	ug/L	ND	1.0	04/02/19 10:11	

LABORATORY CONTROL SAMPLE: 3221729

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	103	103	85-115	
Arsenic, Dissolved	ug/L	100	96.6	97	85-115	
Beryllium, Dissolved	ug/L	100	99.9	100	85-115	
Boron, Dissolved	ug/L	100	102	102	85-115	
Cadmium, Dissolved	ug/L	100	103	103	85-115	
Chromium, Dissolved	ug/L	100	99.9	100	85-115	
Cobalt, Dissolved	ug/L	100	99.6	100	85-115	
Lead, Dissolved	ug/L	100	102	102	85-115	
Selenium, Dissolved	ug/L	100	101	101	85-115	
Thallium, Dissolved	ug/L	100	98.3	98	85-115	
Uranium-238, Dissolved	ug/L	100	99.6	100	85-115	
Vanadium, Dissolved	ug/L	100	99.1	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3221730 3221731

Parameter	Units	10468315002		3221730		3221731		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result						
Antimony, Dissolved	ug/L	ND	100	100	103	105	103	105	70-130	2	20		
Arsenic, Dissolved	ug/L	ND	100	100	101	102	100	102	70-130	2	20		
Beryllium, Dissolved	ug/L	0.24	100	100	97.0	95.1	97	95	70-130	2	20		
Boron, Dissolved	ug/L	30100	100	100	29900	30800	-160	680	70-130	3	20	M6	
Cadmium, Dissolved	ug/L	ND	100	100	96.5	99.7	96	100	70-130	3	20		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Parameter	Units	10468315002		3221730		3221731		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
Chromium, Dissolved	ug/L	ND	100	100	97.9	102	98	102	70-130	4	20			
Cobalt, Dissolved	ug/L	ND	100	100	102	104	101	103	70-130	2	20			
Lead, Dissolved	ug/L	ND	100	100	96.0	98.9	96	99	70-130	3	20			
Selenium, Dissolved	ug/L	22.9	100	100	119	122	96	99	70-130	3	20			
Thallium, Dissolved	ug/L	0.42	100	100	94.2	98.0	94	98	70-130	4	20			
Uranium-238, Dissolved	ug/L	12.7	100	100	111	115	99	103	70-130	4	20			
Vanadium, Dissolved	ug/L	ND	100	100	99.8	102	100	102	70-130	3	20			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468315

QC Batch: 596030 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

METHOD BLANK: 3222399 Matrix: Water
Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	03/29/19 08:35	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	03/29/19 08:35	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	03/29/19 08:35	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	03/29/19 08:35	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	03/29/19 08:35	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	03/29/19 08:35	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	03/29/19 08:35	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	03/29/19 08:35	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	03/29/19 08:35	
Decachlorobiphenyl (S)	%	64	30-125	03/29/19 08:35	
Tetrachloro-m-xylene (S)	%	62	30-125	03/29/19 08:35	

LABORATORY CONTROL SAMPLE & LCSD: 3222400

Parameter	Units	3222401		3222401		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
PCB-1016 (Aroclor 1016)	ug/L	2	1.7	1.7	86	85	45-125	1	20
PCB-1260 (Aroclor 1260)	ug/L	2	1.8	1.9	92	94	49-125	2	20
Decachlorobiphenyl (S)	%				100	100	30-125		
Tetrachloro-m-xylene (S)	%				74	79	30-125		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

QC Batch: 595833 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

METHOD BLANK: 3221099 Matrix: Water
Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	03/28/19 15:33	
2,4-Dichlorophenol	ug/L	ND	10.0	03/28/19 15:33	
2,4-Dimethylphenol	ug/L	ND	10.0	03/28/19 15:33	
2,4-Dinitrophenol	ug/L	ND	10.0	03/28/19 15:33	
2-Chlorophenol	ug/L	ND	10.0	03/28/19 15:33	
2-Methylnaphthalene	ug/L	ND	10.0	03/28/19 15:33	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	03/28/19 15:33	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	03/28/19 15:33	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	03/28/19 15:33	
4-Bromophenylphenyl ether	ug/L	ND	10.0	03/28/19 15:33	
Acenaphthene	ug/L	ND	10.0	03/28/19 15:33	
Anthracene	ug/L	ND	10.0	03/28/19 15:33	
Benzo(a)pyrene	ug/L	ND	10.0	03/28/19 15:33	
Benzoic acid	ug/L	ND	50.0	03/28/19 15:33	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	03/28/19 15:33	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	03/28/19 15:33	
Butylbenzylphthalate	ug/L	ND	10.0	03/28/19 15:33	
Di-n-butylphthalate	ug/L	ND	10.0	03/28/19 15:33	
Di-n-octylphthalate	ug/L	ND	10.0	03/28/19 15:33	
Diethylphthalate	ug/L	ND	10.0	03/28/19 15:33	
Dimethylphthalate	ug/L	ND	10.0	03/28/19 15:33	
Fluoranthene	ug/L	ND	10.0	03/28/19 15:33	
Fluorene	ug/L	ND	10.0	03/28/19 15:33	
Hexachlorobenzene	ug/L	ND	10.0	03/28/19 15:33	
Hexachlorocyclopentadiene	ug/L	ND	50.0	03/28/19 15:33	
Hexachloroethane	ug/L	ND	10.0	03/28/19 15:33	
Isophorone	ug/L	ND	10.0	03/28/19 15:33	
N-Nitrosodimethylamine	ug/L	ND	10.0	03/28/19 15:33	
Pentachlorophenol	ug/L	ND	20.0	03/28/19 15:33	
Phenanthrene	ug/L	ND	10.0	03/28/19 15:33	
Phenol	ug/L	ND	10.0	03/28/19 15:33	
Pyrene	ug/L	ND	10.0	03/28/19 15:33	
2,4,6-Tribromophenol (S)	%	86	52-125	03/28/19 15:33	
2-Fluorobiphenyl (S)	%	69	52-125	03/28/19 15:33	
2-Fluorophenol (S)	%	70	30-125	03/28/19 15:33	
Nitrobenzene-d5 (S)	%	77	55-125	03/28/19 15:33	
p-Terphenyl-d14 (S)	%	84	57-125	03/28/19 15:33	
Phenol-d6 (S)	%	74	30-125	03/28/19 15:33	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

LABORATORY CONTROL SAMPLE & LCSD: 3221100			3221101								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	42.7	40.9	85	82	60-125	4	20		
2,4-Dichlorophenol	ug/L	50	40.4	39.3	81	79	56-125	3	20		
2,4-Dimethylphenol	ug/L	50	40.4	37.2	81	74	33-125	8	20		
2,4-Dinitrophenol	ug/L	50	38.6	38.3	77	77	32-125	1	20		
2-Chlorophenol	ug/L	50	34.9	38.3	70	77	52-125	9	20		
2-Methylnaphthalene	ug/L	50	40.0	38.1	80	76	52-125	5	20		
2-Methylphenol(o-Cresol)	ug/L	50	37.8	37.6	76	75	55-125	0	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	38.2	37.6	76	75	57-125	2	20		
3,3'-Dichlorobenzidine	ug/L	50	27.1J	38.6J	54	77	39-150		20		
4-Bromophenylphenyl ether	ug/L	50	44.3	43.3	89	87	61-125	2	20		
Acenaphthene	ug/L	50	42.9	42.7	86	85	59-125	1	20		
Anthracene	ug/L	50	45.2	44.3	90	89	64-125	2	20		
Benzo(a)pyrene	ug/L	50	42.6	41.2	85	82	63-125	3	20		
Benzoic acid	ug/L	50	44.3J	38.9J	89	78	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	35.7	38.1	71	76	49-125	6	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	42.0	41.4	84	83	68-125	2	20		
Butylbenzylphthalate	ug/L	50	42.5	41.4	85	83	67-125	3	20		
Di-n-butylphthalate	ug/L	50	44.9	44.6	90	89	67-125	1	20		
Di-n-octylphthalate	ug/L	50	42.0	41.6	84	83	67-125	1	20		
Diethylphthalate	ug/L	50	43.6	43.5	87	87	64-125	0	20		
Dimethylphthalate	ug/L	50	43.8	43.3	88	87	65-125	1	20		
Fluoranthene	ug/L	50	45.2	44.0	90	88	64-125	3	20		
Fluorene	ug/L	50	42.7	43.0	85	86	63-125	1	20		
Hexachlorobenzene	ug/L	50	47.7	45.6	95	91	61-125	4	20		
Hexachlorocyclopentadiene	ug/L	50	26.1J	26.5J	52	53	30-125		20		
Hexachloroethane	ug/L	50	32.8	36.4	66	73	30-125	10	20		
Isophorone	ug/L	50	43.2	41.5	86	83	59-125	4	20		
N-Nitrosodimethylamine	ug/L	50	36.1	38.6	72	77	43-125	7	20		
Pentachlorophenol	ug/L	50	43.0	41.5	86	83	35-125	3	20		
Phenanthrene	ug/L	50	44.9	43.7	90	87	65-125	3	20		
Phenol	ug/L	50	36.7	38.1	73	76	54-125	4	20		
Pyrene	ug/L	50	42.2	42.1	84	84	65-125	0	20		
2,4,6-Tribromophenol (S)	%				90	91	52-125				
2-Fluorobiphenyl (S)	%				80	78	52-125				
2-Fluorophenol (S)	%				67	75	30-125				
Nitrobenzene-d5 (S)	%				77	77	55-125				
p-Terphenyl-d14 (S)	%				80	79	57-125				
Phenol-d6 (S)	%				71	76	30-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

QC Batch: 596056 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

METHOD BLANK: 3222530 Matrix: Water
 Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	03/27/19 20:05	

LABORATORY CONTROL SAMPLE: 3222531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3222532 3222533

Parameter	Units	10468314001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Chloride	mg/L	2.8	12.5	13.9	12.5	13.8	88	88	90-110	0	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3222534 3222535

Parameter	Units	10468314010 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Chloride	mg/L	3.3	12.5	14.5	12.5	14.4	90	89	90-110	0	20	M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468315

QC Batch: 595966 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

METHOD BLANK: 3222211 Matrix: Water
Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/27/19 08:40	

LABORATORY CONTROL SAMPLE: 3222212

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3222213 3222214

Parameter	Units	10468315004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	0.2	0.2	0.15	0.14	73	67	85-115	8	20	M3

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

QC Batch: 163578 Analysis Method: EPA 350.1 rev. 2 (1993)
 QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
 Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

METHOD BLANK: 644687 Matrix: Water
 Associated Lab Samples: 10468315001, 10468315002, 10468315003, 10468315004, 10468315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	04/03/19 08:35	

LABORATORY CONTROL SAMPLE: 644688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 644689 644690

Parameter	Units	12123082002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	<0.11	5	5	5.2	5.0	103	101	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 644691 644692

Parameter	Units	10468606003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	6.3	5	5	11.2	11.4	97	101	90-110	2	10	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

QC Batch: 597012

Analysis Method: SM 4500-CN-E

QC Batch Method: SM 4500-CN-E

Analysis Description: SM4500CN-E Cyanide

Associated Lab Samples: 10468315001

METHOD BLANK: 3228391

Matrix: Water

Associated Lab Samples: 10468315001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/02/19 12:32	

LABORATORY CONTROL SAMPLE: 3228392

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	257	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3228393 3228394

Parameter	Units	10468350001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	ND	250	250	74.4	58.8	25	19	80-120	23	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3228395 3228396

Parameter	Units	10468351001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	ND	250	250	233	231	87	86	80-120	1	30	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468315

QC Batch: 598088 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10468315002, 10468315003, 10468315004, 10468315005

METHOD BLANK: 3234106 Matrix: Water
Associated Lab Samples: 10468315002, 10468315003, 10468315004, 10468315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/08/19 13:09	

LABORATORY CONTROL SAMPLE: 3234107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	249	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3234108 3234109

Parameter	Units	10468668002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	ND	250	209	250	226	76	83	80-120	8	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3234110 3234111

Parameter	Units	10468315002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	ND	250	232	250	229	88	87	80-120	1	30	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Sample: Field Blank 1 **Lab ID: 10468315001** Collected: 03/26/19 10:10 Received: 03/26/19 17:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	-0.464 ± 0.923 (2.83) C:NA T:NA	pCi/L	04/05/19 09:50	12587-46-1	
Gross Beta	EPA 900.0	0.672 ± 1.97 (4.68) C:NA T:NA	pCi/L	04/05/19 09:50	12587-47-2	

Sample: 603281 **Lab ID: 10468315002** Collected: 03/26/19 11:30 Received: 03/26/19 17:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	13.2 ± 4.16 (3.82) C:NA T:NA	pCi/L	04/04/19 19:59	12587-46-1	
Gross Beta	EPA 900.0	26.1 ± 5.63 (4.10) C:NA T:NA	pCi/L	04/04/19 19:59	12587-47-2	

Sample: 603287 **Lab ID: 10468315003** Collected: 03/26/19 13:50 Received: 03/26/19 17:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	8.95 ± 2.91 (2.69) C:NA T:NA	pCi/L	04/04/19 19:59	12587-46-1	
Gross Beta	EPA 900.0	5.25 ± 2.12 (3.20) C:NA T:NA	pCi/L	04/04/19 19:59	12587-47-2	

Sample: 603288 **Lab ID: 10468315004** Collected: 03/26/19 15:30 Received: 03/26/19 17:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	16.1 ± 4.62 (3.64) C:NA T:NA	pCi/L	04/04/19 19:59	12587-46-1	
Gross Beta	EPA 900.0	6.42 ± 2.73 (4.19) C:NA T:NA	pCi/L	04/04/19 19:59	12587-47-2	

Sample: 603289 **Lab ID: 10468315005** Collected: 03/26/19 16:30 Received: 03/26/19 17:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	13.6 ± 4.68 (4.83) C:NA T:NA	pCi/L	04/04/19 19:59	12587-46-1	
Gross Beta	EPA 900.0	28.8 ± 6.21 (4.48) C:NA T:NA	pCi/L	04/04/19 19:59	12587-47-2	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

QC Batch:	336317	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10468315001, 10468315002, 10468315003, 10468315004, 10468315005		

METHOD BLANK:	1636866	Matrix:	Water
Associated Lab Samples:	10468315001, 10468315002, 10468315003, 10468315004, 10468315005		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.675 ± 0.768 (1.53) C:NA T:NA	pCi/L	04/05/19 07:54	
Gross Beta	0.808 ± 0.941 (2.00) C:NA T:NA	pCi/L	04/05/19 07:54	

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10468315

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 596327

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 596452

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
S0	Surrogate recovery outside laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10468315001	Field Blank 1	EPA Mod. 3510C	596030	EPA 8082A	596452
10468315002	603281	EPA Mod. 3510C	596030	EPA 8082A	596452
10468315003	603287	EPA Mod. 3510C	596030	EPA 8082A	596452
10468315004	603288	EPA Mod. 3510C	596030	EPA 8082A	596452
10468315005	603289	EPA Mod. 3510C	596030	EPA 8082A	596452
10468315001	Field Blank 1	EPA 200.7	595875	EPA 200.7	596209
10468315002	603281	EPA 200.7	595875	EPA 200.7	596209
10468315003	603287	EPA 200.7	595875	EPA 200.7	596209
10468315004	603288	EPA 200.7	595875	EPA 200.7	596209
10468315005	603289	EPA 200.7	595875	EPA 200.7	596209
10468315001	Field Blank 1	EPA 200.8	595880	EPA 200.8	596949
10468315002	603281	EPA 200.8	595880	EPA 200.8	596949
10468315003	603287	EPA 200.8	595880	EPA 200.8	596949
10468315004	603288	EPA 200.8	595880	EPA 200.8	596949
10468315005	603289	EPA 200.8	595880	EPA 200.8	596949
10468315001	Field Blank 1	EPA 3520	595833	EPA 8270D	596327
10468315002	603281	EPA 3520	595833	EPA 8270D	596327
10468315003	603287	EPA 3520	595833	EPA 8270D	596327
10468315004	603288	EPA 3520	595833	EPA 8270D	596327
10468315005	603289	EPA 3520	595833	EPA 8270D	596327
10468315002	603281				
10468315003	603287				
10468315004	603288				
10468315005	603289				
10468315001	Field Blank 1	EPA 900.0	336317		
10468315002	603281	EPA 900.0	336317		
10468315003	603287	EPA 900.0	336317		
10468315004	603288	EPA 900.0	336317		
10468315005	603289	EPA 900.0	336317		
10468315001	Field Blank 1	EPA 300.0	596056		
10468315002	603281	EPA 300.0	596056		
10468315003	603287	EPA 300.0	596056		
10468315004	603288	EPA 300.0	596056		
10468315005	603289	EPA 300.0	596056		
10468315001	Field Blank 1	SM 3500-Cr B Modified	595966		
10468315002	603281	SM 3500-Cr B Modified	595966		
10468315003	603287	SM 3500-Cr B Modified	595966		
10468315004	603288	SM 3500-Cr B Modified	595966		
10468315005	603289	SM 3500-Cr B Modified	595966		
10468315002	603281	EPA 350.1			
10468315003	603287	EPA 350.1			
10468315004	603288	EPA 350.1			
10468315005	603289	EPA 350.1			
10468315001	Field Blank 1	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468315

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10468315002	603281	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468315003	603287	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468315004	603288	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468315005	603289	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468315001	Field Blank 1	SM 4500-CN-E	597012	SM 4500-CN-E	597101
10468315002	603281	SM 4500-CN-E	598088	SM 4500-CN-E	598190
10468315003	603287	SM 4500-CN-E	598088	SM 4500-CN-E	598190
10468315004	603288	SM 4500-CN-E	598088	SM 4500-CN-E	598190
10468315005	603289	SM 4500-CN-E	598088	SM 4500-CN-E	598190

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WO#: 10468315



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<p>Minnesota Pollution Control Agency</p>	<p>Chain-of-Custody Form <small>revised 2013.0909</small></p>			<p>Work Order Number: 10468315</p>
	<p>PROJECT/CLIENT INFO</p>			<p>Turnaround Time: 10468315</p>
	<p>Facility Code: MNSW-057</p>	<p>Program Code (MDH Lab Only):</p>		<p>LABORATORY</p>
	<p>Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters</p>	<p>Project Task Code: PRJ07786</p>	<p>Lab Name: Pace Analytical - Minneapolis, MN</p>	
	<p>Project Manager: Brad Jacobson 612-607-6375</p>	<p>EPIC PROFILE #: 38716 Line 2</p>	<p>Address: 1700 SE Elm Street Minneapolis MN 55414</p>	
<p>Potential Hazard?</p>	<p>If yes, add information to Sampler Comments Section</p>			<p>Phone No: 612-607-6400</p>

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS										ANALYSIS REQUESTED						Lab Sample No.	#			
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	PRESERV.	None	HAND3	None			H2SO4	H4OH	None
Field Blank	QC-FB	3/26/19	1010			G	NW	QC-BLANK	N		14	X	X	X	X	X	X	X	61	1
603281	Sample	3/26/19	1130			G	NW	WTF Ground	N		14	X	X	X	X	X	X	X	62	2
603287	Sample	3/26/19	1350			G	NW	WTF Ground	N		14	X	X	X	X	X	X	X	63	3
603288	Sample	3/26/19	1530			G	NW	WTF Ground	N		14	X	X	X	X	X	X	X	64	4
603289	Sample	3/26/19	1630			G	NW	WTF Ground	N		14	X	X	X	X	X	X	X	65	5
									N											6
									N											7
									N											8
									N											9
									N											10

Sampled By: David Anderson / Chris Pelasi
 Sampler's Signature: *David Anderson / Chris Pelasi*
 Phone #:

Receiving Comments:	Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
	(Sampler) David Anderson / Pace Analytical	3/26/19 / 1650	Eug Price	3/26/19 205

T=8.46-89.7
 13.3, 16.6 C

Sample Condition Upon Receipt

Client Name: FSD

Project #: **WO# 10468315**

PM: JMA Due Date: 04/10/19
CLIENT: PAST-MINFLD

Courier: Fed Ex UPS USPS Client
 Pace Speedee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: G87A9155100842 G87A9170600254 Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>8.4, 6.8, 9.7, 13.9, 9.6</u> °C	Average Corrected Temp (no temp blank only): _____ °C	See Exceptions <input type="checkbox"/>
Correction Factor: <u>True</u>	Cooler Temp Corrected w/temp blank: <u>8.1, 6.8, 9.7, 13.3, 9.6</u> °C		

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: ERM 3/26/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <u>JMA 3/21/19</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: See Exception <input type="checkbox"/>
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>1-5</u> <u>ERM 3/26</u> <input checked="" type="checkbox"/> NaOH <u>2/2</u> <input checked="" type="checkbox"/> HNO ₃ <u>2/2</u> <input checked="" type="checkbox"/> H ₂ SO ₄ <u>1/1</u> <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See Exception <input type="checkbox"/>
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (If purchased): _____

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 03/27/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: [Signature]

During sample triage, this form is to be placed in each cooler that arrives above 6.0 degrees Celsius

SCUR Exceptions:

Workorder #:

Out of Temp Sample IDs	Container Type	# of Containers	PM Notified? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																											
			If yes, indicate who was contacted/date/time. If no, indicate reason why. <i>Same day, on site</i>																											
			Multiple Cooler Project? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If you answered yes, fill out information to the left.																											
			<table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="3" style="text-align: center;">No Temp Blank</th> </tr> <tr> <th style="width:33%;">Read Temp</th> <th style="width:33%;">Corrected Temp</th> <th style="width:33%;">Average Temp</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	No Temp Blank			Read Temp	Corrected Temp	Average Temp																					
No Temp Blank																														
Read Temp	Corrected Temp	Average Temp																												

Other Issues

Issue Type:	Container Type	# of Containers
Sample ID		

Tracking Number

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preserv.	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance after addition?	Initials
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO# : 12122937

12122937

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: -0.1 Cooler Temp Corrected °C: 0.2 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 3/27/19 ΔC

Comments: RH 3/28/19

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Carrigan Date: 3/28/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace MN

Project # 30286431

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4635601959737

Label	<u>mn</u>
LIMS Login	<u>mn</u>

Custody Seal on Cooler/Box Present: yes no MDS3-2019 Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>MDS3-2019</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WA</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>MDS</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>MDS</u> Date: <u>3-28-19</u>

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



10-Apr-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10468315**

Work Order: **19031541**

Dear Jennifer,

ALS Environmental received 5 samples on 28-Mar-2019 09:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 11.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10468315
Work Order: 19031541

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
19031541-01	Field Blank 1	Water		3/26/2019 10:10	3/28/2019 09:00	<input type="checkbox"/>
19031541-02	603281	Water		3/26/2019 11:30	3/28/2019 09:00	<input type="checkbox"/>
19031541-03	603287	Water		3/26/2019 13:50	3/28/2019 09:00	<input type="checkbox"/>
19031541-04	603288	Water		3/26/2019 15:30	3/28/2019 09:00	<input type="checkbox"/>
19031541-05	603289	Water		3/26/2019 16:30	3/28/2019 09:00	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10468315
WorkOrder: 19031541

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 10-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468315

Work Order: 19031541

Sample ID: Field Blank 1

Lab ID: 19031541-01

Collection Date: 3/26/2019 10:10 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/5/2019 02:10 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 10-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468315

Work Order: 19031541

Sample ID: 603281

Lab ID: 19031541-02

Collection Date: 3/26/2019 11:30 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/5/2019 02:10 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 10-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468315

Work Order: 19031541

Sample ID: 603287

Lab ID: 19031541-03

Collection Date: 3/26/2019 01:50 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/5/2019 02:10 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 10-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468315

Work Order: 19031541

Sample ID: 603288

Lab ID: 19031541-04

Collection Date: 3/26/2019 03:30 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	23		20	µg/L	1	4/5/2019 02:10 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 10-Apr-19

Client: Pace Analytical Services, LLC
Project: 10468315
Sample ID: 603289
Collection Date: 3/26/2019 04:30 PM

Work Order: 19031541
Lab ID: 19031541-05
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	37		20	µg/L	1	4/5/2019 02:10 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 19031541
Project: 10468315

QC BATCH REPORT

Batch ID: **R257895** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R257895-R257895				Units: µg/L		Analysis Date: 4/5/2019 02:10 PM		
Client ID:		Run ID: WETCHEM_190405G		SeqNo: 5593578		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	ND	20								

LCS		Sample ID: LCS-R257895-R257895				Units: µg/L		Analysis Date: 4/5/2019 02:10 PM		
Client ID:		Run ID: WETCHEM_190405G		SeqNo: 5593579		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	272.1	20	250	0	109	81-119	0			

MS		Sample ID: 19031541-01A MS				Units: µg/L		Analysis Date: 4/5/2019 02:10 PM		
Client ID: Field Blank 1		Run ID: WETCHEM_190405G		SeqNo: 5593581		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	256.1	20	250	-9.96	106	81-119	0			

MSD		Sample ID: 19031541-01A MSD				Units: µg/L		Analysis Date: 4/5/2019 02:10 PM		
Client ID: Field Blank 1		Run ID: WETCHEM_190405G		SeqNo: 5593582		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	251.7	20	250	-9.96	105	81-119	256.1	1.72	20	

The following samples were analyzed in this batch:

19031541-01A	19031541-02A	19031541-03A
19031541-04A	19031541-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Chain of Custody

14051591



Workorder: 10468315 Workorder Name: 19-01567 MPCA Freeway LF 19 WT Results Requested By: 4/17/2019

Report / Invoice To **Subcontract To** **Requested Analysis**

Jennifer Anderson
Pace Analytical Minnesota
1700 Elm Street
Suite 200
Minneapolis, MN 55414
Phone (612)607-6436
Email: jennifer.anderson@pacelabs.com

ALS P.O. 10468315
3352 128th Avenue
Holland, MI 49424

State of Sample Origin: MN

Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Preserved Containers										Free Cyanide	LAB USE ONLY		
					1	2	3	4	5	6	7	8	9	10				
1	Field Blank 1	3/26/2019 10:10	10468315001	Water	1												X	
2	603281	3/26/2019 11:30	10468315002	Water													X	
3	603287	3/26/2019 13:50	10468315003	Water													X	
4	603288	3/26/2019 15:30	10468315004	Water													X	
5	603289	3/26/2019 16:30	10468315005	Water													X	

Comments

Transfers	Released By	Date/Time	Received By	Date/Time
1	<i>[Signature]</i>	3/27/19 14:30	<i>[Signature]</i>	3/28/19 09:50
2				
3				

Cooler Temperature on Receipt 22 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

SP2

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **28-Mar-19 09:00**

Work Order: **19031541**

Received by: **DS**

Checklist completed by Diane Shaw 28-Mar-19
eSignature Date

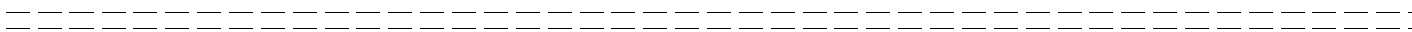
Reviewed by: Chad Whilton 28-Mar-19
eSignature Date

Matrices: Water

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>2.2/2.2 c</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>3/28/2019 9:55:03 AM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<u></u>		

Login Notes:



Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 12, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/28/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAP Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2019
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Field Blank 1	A191316-01	Water	03/26/2019	03/28/2019
603281	A191316-02	Water	03/26/2019	03/28/2019
603287	A191316-03	Water	03/26/2019	03/28/2019
603288	A191316-04	Water	03/26/2019	03/28/2019
603289	A191316-05	Water	03/26/2019	03/28/2019

CASE NARRATIVE

Sample Receipt Information:

5 samples were received on 03/28/2019. Samples were received at 1.4 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

Field Blank 1

A191316-01 (Water)

Date Sampled
03/26/2019 10:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 22:57	EPA 8270D	
Surrogate: Atrazine-d5		83.6 %		56.9-123	04/01/2019	04/02/2019 22:57	EPA 8270D	
Surrogate: Parathion-d10		210 %		23.8-169	04/01/2019	04/02/2019 22:57	EPA 8270D	S
Surrogate: Triphenyl phosphate		89.9 %		50.5-178	04/01/2019	04/02/2019 22:57	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904136

2,4-D	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:13	EPA 8151A	
Surrogate: 2,4-D-d5		74.3 %		44.2-121	04/02/2019	04/04/2019 02:13	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

603281

Date Sampled

A191316-02 (Water)

03/26/2019 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:25	EPA 8270D	
Surrogate: Atrazine-d5		82.5 %		56.9-123	04/01/2019	04/02/2019 23:25	EPA 8270D	
Surrogate: Parathion-d10		139 %		23.8-169	04/01/2019	04/02/2019 23:25	EPA 8270D	
Surrogate: Triphenyl phosphate		90.8 %		50.5-178	04/01/2019	04/02/2019 23:25	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904136

2,4-D	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/02/2019	04/04/2019 02:48	EPA 8151A	
Surrogate: 2,4-D-d5		84.0 %		44.2-121	04/02/2019	04/04/2019 02:48	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

603287

Date Sampled

A191316-03 (Water)

03/26/2019 13:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/02/2019 23:53	EPA 8270D	
Surrogate: Atrazine-d5		96.8 %		56.9-123	04/01/2019	04/02/2019 23:53	EPA 8270D	
Surrogate: Parathion-d10		90.3 %		23.8-169	04/01/2019	04/02/2019 23:53	EPA 8270D	
Surrogate: Triphenyl phosphate		101 %		50.5-178	04/01/2019	04/02/2019 23:53	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904136

2,4-D	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:24	EPA 8151A	
Surrogate: 2,4-D-d5		77.2 %		44.2-121	04/02/2019	04/04/2019 03:24	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

603288

A191316-04 (Water)

Date Sampled
03/26/2019 15:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:21	EPA 8270D	
Surrogate: Atrazine-d5		83.9 %		56.9-123	04/01/2019	04/03/2019 00:21	EPA 8270D	
Surrogate: Parathion-d10		76.9 %		23.8-169	04/01/2019	04/03/2019 00:21	EPA 8270D	
Surrogate: Triphenyl phosphate		96.7 %		50.5-178	04/01/2019	04/03/2019 00:21	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904136

2,4-D	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/02/2019	04/04/2019 03:59	EPA 8151A	
Surrogate: 2,4-D-d5		82.2 %		44.2-121	04/02/2019	04/04/2019 03:59	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

603289

Date Sampled

A191316-05 (Water)

03/26/2019 16:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 00:49	EPA 8270D	
Surrogate: Atrazine-d5		88.6 %		56.9-123	04/01/2019	04/03/2019 00:49	EPA 8270D	
Surrogate: Parathion-d10		94.4 %		23.8-169	04/01/2019	04/03/2019 00:49	EPA 8270D	
Surrogate: Triphenyl phosphate		105 %		50.5-178	04/01/2019	04/03/2019 00:49	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904136

2,4-D	ND	0.50	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/02/2019	04/04/2019 04:34	EPA 8151A	
Surrogate: 2,4-D-d5		72.6 %		44.2-121	04/02/2019	04/04/2019 04:34	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904126 - EPA 3510C

Blank (A904126-BLK1)

Prepared: 04/01/2019 Analyzed: 04/02/2019 22:29

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							

Surrogate: Atrazine-d5 0.431 ug/L 0.5000 86.2 56.9-123

Surrogate: Parathion-d10 0.432 ug/L 0.5000 86.3 23.8-169

Surrogate: Triphenyl phosphate 0.424 ug/L 0.5000 84.9 50.5-178

LCS (A904126-BS1)

Prepared: 04/01/2019 Analyzed: 04/03/2019 02:42

Acetochlor	0.818	0.50	ug/L	1.000		81.8	67.8-122
Alachlor	0.845	0.50	ug/L	1.000		84.5	68.6-119
Atrazine	0.827	0.50	ug/L	1.000		82.7	68.6-115
Chlorpyrifos	0.833	0.50	ug/L	1.000		83.3	63.1-120
Cyanazine	0.892	0.20	ug/L	1.000		89.2	55.3-143
Desethylatrazine	0.827	0.50	ug/L	1.000		82.7	67.8-115
Deisopropylatrazine	0.669	0.50	ug/L	1.000		66.9	50.1-100
Dimethenamid	0.845	0.50	ug/L	1.000		84.5	70.3-121
EPTC	0.673	0.50	ug/L	1.000		67.3	50.4-101
Ethalfuralin	0.846	0.50	ug/L	1.000		84.6	42.6-121
Fonofos	0.981	0.50	ug/L	1.000		98.1	56.6-119
Metolachlor	0.851	0.50	ug/L	1.000		85.1	71.3-128
Metribuzin	0.826	0.50	ug/L	1.000		82.6	64.9-120
Pendimethalin	0.774	0.50	ug/L	1.000		77.4	60.9-128
Phorate	0.674	0.30	ug/L	1.000		67.4	37.3-112
Prometon	0.836	0.50	ug/L	1.000		83.6	67.1-120
Propachlor	0.999	0.50	ug/L	1.000		99.9	66.2-127
Propazine	0.928	0.50	ug/L	1.000		92.8	68.2-118
Simazine	0.848	0.50	ug/L	1.000		84.8	67.2-117

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Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904126 - EPA 3510C

LCS (A904126-BS1)

Prepared: 04/01/2019 Analyzed: 04/03/2019 02:42

Terbufos	0.637	0.20	ug/L	1.000		63.7	34.3-111			
Triallate	1.01	0.50	ug/L	1.000		101	53-121			
Trifluralin	0.675	0.50	ug/L	1.000		67.5	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.443</i>		<i>ug/L</i>	<i>0.5000</i>		<i>88.6</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.534</i>		<i>ug/L</i>	<i>0.5000</i>		<i>107</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.478</i>		<i>ug/L</i>	<i>0.5000</i>		<i>95.6</i>	<i>50.5-178</i>			

Matrix Spike (A904126-MS1)

Source: A191315-01

Prepared: 04/01/2019 Analyzed: 04/03/2019 01:45

Acetochlor	0.812	0.50	ug/L	1.000	ND	81.2	66.8-131			
Alachlor	0.816	0.50	ug/L	1.000	ND	81.6	68.2-133			
Atrazine	0.829	0.50	ug/L	1.000	ND	82.9	70-119			
Chlorpyrifos	0.846	0.50	ug/L	1.000	ND	84.6	64.9-131			
Cyanazine	0.878	0.20	ug/L	1.000	ND	87.8	62.6-155			
Desethylatrazine	0.841	0.50	ug/L	1.000	ND	84.1	63.2-129			
Deisopropylatrazine	0.613	0.50	ug/L	1.000	ND	61.3	43-119			
Dimethenamid	0.816	0.50	ug/L	1.000	ND	81.6	71-132			
EPTC	0.644	0.50	ug/L	1.000	ND	64.4	50-110			
Ethalfuralin	0.719	0.50	ug/L	1.000	ND	71.9	42.9-140			
Fonofos	0.772	0.50	ug/L	1.000	ND	77.2	52.1-124			
Metolachlor	0.846	0.50	ug/L	1.000	ND	84.6	50.8-155			
Metribuzin	0.812	0.50	ug/L	1.000	ND	81.2	66.7-131			
Pendimethalin	0.787	0.50	ug/L	1.000	ND	78.7	61.2-152			
Phorate	0.704	0.30	ug/L	1.000	ND	70.4	42-122			
Prometon	0.811	0.50	ug/L	1.000	ND	81.1	64.1-135			
Propachlor	0.774	0.50	ug/L	1.000	ND	77.4	61.4-137			
Propazine	0.891	0.50	ug/L	1.000	ND	89.1	68.2-126			
Simazine	0.789	0.50	ug/L	1.000	ND	78.9	68.4-122			
Terbufos	0.720	0.20	ug/L	1.000	ND	72.0	43.5-119			
Triallate	0.781	0.50	ug/L	1.000	ND	78.1	58.4-122			
Trifluralin	0.682	0.50	ug/L	1.000	ND	68.2	51-132			
<i>Surrogate: Atrazine-d5</i>	<i>0.409</i>		<i>ug/L</i>	<i>0.5000</i>		<i>81.8</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.408</i>		<i>ug/L</i>	<i>0.5000</i>		<i>81.7</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.484</i>		<i>ug/L</i>	<i>0.5000</i>		<i>96.7</i>	<i>50.5-178</i>			

Matrix Spike Dup (A904126-MSD1)

Source: A191315-01

Prepared: 04/01/2019 Analyzed: 04/03/2019 02:13

Acetochlor	0.774	0.50	ug/L	1.010	ND	76.6	66.8-131	4.77	20	
Alachlor	0.799	0.50	ug/L	1.010	ND	79.1	68.2-133	2.19	20	
Atrazine	0.788	0.50	ug/L	1.010	ND	78.0	70-119	5.04	20	
Chlorpyrifos	0.821	0.50	ug/L	1.010	ND	81.3	64.9-131	3.00	20	
Cyanazine	0.917	0.20	ug/L	1.010	ND	90.7	62.6-155	4.34	20	
Desethylatrazine	0.845	0.50	ug/L	1.010	ND	83.7	63.2-129	0.445	20	
Deisopropylatrazine	0.692	0.50	ug/L	1.010	ND	68.5	43-119	12.1	20	
Dimethenamid	0.800	0.50	ug/L	1.010	ND	79.2	71-132	1.95	20	
EPTC	0.692	0.50	ug/L	1.010	ND	68.5	50-110	7.24	20	
Ethalfuralin	0.831	0.50	ug/L	1.010	ND	82.3	42.9-140	14.4	20	
Fonofos	0.862	0.50	ug/L	1.010	ND	85.3	52.1-124	11.0	20	

Pace Analytical
1700 Elm Street, Suite 200
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Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904126 - EPA 3510C

Matrix Spike Dup (A904126-MSD1)

Source: A191315-01

Prepared: 04/01/2019 Analyzed: 04/03/2019 02:13

Metolachlor	0.840	0.50	ug/L	1.010	ND	83.2	50.8-155	0.688	20	
Metribuzin	0.814	0.50	ug/L	1.010	ND	80.6	66.7-131	0.368	20	
Pendimethalin	0.778	0.50	ug/L	1.010	ND	77.1	61.2-152	1.10	20	
Phorate	0.689	0.30	ug/L	1.010	ND	68.2	42-122	2.09	20	
Prometon	0.799	0.50	ug/L	1.010	ND	79.1	64.1-135	1.52	20	
Propachlor	0.926	0.50	ug/L	1.010	ND	91.7	61.4-137	17.9	20	
Propazine	0.882	0.50	ug/L	1.010	ND	87.4	68.2-126	1.02	20	
Simazine	0.832	0.50	ug/L	1.010	ND	82.4	68.4-122	5.30	20	
Terbufos	0.659	0.20	ug/L	1.010	ND	65.2	43.5-119	8.81	20	
Triallate	0.856	0.50	ug/L	1.010	ND	84.8	58.4-122	9.17	20	
Trifluralin	0.737	0.50	ug/L	1.010	ND	72.9	51-132	7.66	20	
Surrogate: Atrazine-d5	0.425		ug/L	0.5051		84.1	56.9-123			
Surrogate: Parathion-d10	0.479		ug/L	0.5051		94.8	23.8-169			
Surrogate: Triphenyl phosphate	0.487		ug/L	0.5051		96.4	50.5-178			

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Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904136 - EPA 3510C

Blank (A904136-BLK1)

Prepared: 04/02/2019 Analyzed: 04/03/2019 17:57

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
<i>Surrogate: 2,4-D-d5</i>	<i>1.62</i>		<i>ug/L</i>	<i>2.006</i>		<i>80.6</i>	<i>44.2-121</i>			

LCS (A904136-BS1)

Prepared: 04/02/2019 Analyzed: 04/03/2019 17:21

2,4-D	2.15	0.50	ug/L	2.000		107	64.6-148			
2,4-DB	2.13	0.50	ug/L	2.000		107	66.7-143			
2,4,5-T	2.12	0.50	ug/L	2.000		106	63.4-133			
2,4,5-TP (Silvex)	2.08	0.50	ug/L	2.000		104	63-145			
Bentazon	1.08	0.50	ug/L	1.000		108	52.5-139			
Dicamba	1.89	0.50	ug/L	2.000		94.4	55.4-143			
MCPA	2.11	0.30	ug/L	2.000		105	33.5-143			
Picloram	0.936	0.50	ug/L	1.000		93.6	47.9-113			
Triclopyr	2.07	0.50	ug/L	2.000		103	65.1-141			
<i>Surrogate: 2,4-D-d5</i>	<i>1.60</i>		<i>ug/L</i>	<i>2.006</i>		<i>79.6</i>	<i>44.2-121</i>			

Matrix Spike (A904136-MS1)

Source: A191315-01

Prepared: 04/02/2019 Analyzed: 04/03/2019 21:31

2,4-D	2.20	0.50	ug/L	2.105	ND	104	44.6-158			
2,4-DB	2.13	0.50	ug/L	2.105	ND	101	64.7-136			
2,4,5-T	2.19	0.50	ug/L	2.105	ND	104	54.1-129			
2,4,5-TP (Silvex)	2.13	0.50	ug/L	2.105	ND	101	55.3-147			
Bentazon	1.09	0.50	ug/L	1.053	ND	103	35.5-160			
Dicamba	2.00	0.50	ug/L	2.105	ND	94.8	45.2-150			
MCPA	2.14	0.30	ug/L	2.105	ND	101	33.6-149			
Picloram	0.977	0.50	ug/L	1.053	ND	92.8	32.6-139			
Triclopyr	2.17	0.50	ug/L	2.105	ND	103	56.8-143			
<i>Surrogate: 2,4-D-d5</i>	<i>1.81</i>		<i>ug/L</i>	<i>2.112</i>		<i>85.7</i>	<i>44.2-121</i>			

Matrix Spike Dup (A904136-MSD1)

Source: A191315-01

Prepared: 04/02/2019 Analyzed: 04/03/2019 22:06

2,4-D	2.72	0.50	ug/L	2.151	ND	126	44.6-158	21.2	20	X
2,4-DB	2.34	0.50	ug/L	2.151	ND	109	64.7-136	9.22	20	
2,4,5-T	2.48	0.50	ug/L	2.151	ND	116	54.1-129	12.6	20	
2,4,5-TP (Silvex)	2.50	0.50	ug/L	2.151	ND	116	55.3-147	15.9	20	
Bentazon	1.31	0.50	ug/L	1.075	ND	122	35.5-160	18.9	20	
Dicamba	2.21	0.50	ug/L	2.151	ND	103	45.2-150	10.3	20	
MCPA	2.45	0.30	ug/L	2.151	ND	114	33.6-149	13.8	20	
Picloram	1.09	0.50	ug/L	1.075	ND	102	32.6-139	11.4	20	
Triclopyr	2.49	0.50	ug/L	2.151	ND	116	56.8-143	14.0	20	
<i>Surrogate: 2,4-D-d5</i>	<i>1.97</i>		<i>ug/L</i>	<i>2.157</i>		<i>91.4</i>	<i>44.2-121</i>			

Pace Analytical
1700 Elm Street, Suite 200
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Project: MPCA Freeway LF Water - MN
Project Number: 10468315
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A191316



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Workorder: 10468315 Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Owner Received Date: 3/26/2019 Results Requested By: 4/17/2019

Report To		Subcontract To					Requested Analysis														
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																			
							MDA List 1		MDA List 2												
							Preserved Containers														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved AGIU															LAB USE ONLY
1	Field Blank 1	PS	3/26/2019 10:10	10468315001	Water	4															01
2	603281	PS	3/26/2019 11:30	10468315002	Water	4						X	X								02
3	603287	PS	3/26/2019 13:50	10468315003	Water	4						X	X								03
4	603288	PS	3/26/2019 15:30	10468315004	Water	4						X	X								04
5	603289	PS	3/26/2019 16:30	10468315005	Water	4						X	X								05

Transfers						Comments
Released By	Date/Time	Received By	Date/Time			
[Signature]	3/28/19	[Signature]	3/28/19			Need MPCA Equis EDD and Barr Equis 5 EDD
			1035			
Cooler Temperature on Receipt 1.4° C		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp 7/13/19

April 17, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468460

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 27, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468460

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683

Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10468460001	813766	Water	03/27/19 10:40	03/27/19 16:17
10468460002	813741	Water	03/27/19 11:40	03/27/19 16:17
10468460003	M-1	Water	03/27/19 11:42	03/27/19 16:17
10468460004	813768	Water	03/27/19 12:40	03/27/19 16:17
10468460005	813767	Water	03/27/19 13:40	03/27/19 16:17
10468460006	813765	Water	03/27/19 15:40	03/27/19 16:17

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10468460001	813766	EPA 8082A	RAG	11	PASI-M		
		EPA 200.7	IP	9	PASI-M		
		EPA 200.8	RJS	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	NEG	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10468460002	813741	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	IP	9	PASI-M
EPA 200.8	RJS			12	PASI-M		
EPA 8270D	STB			38	PASI-M		
	CLJ			16	PASI-V		
EPA 900.0	NEG			2	PASI-PA		
EPA 300.0	KEO			1	PASI-M		
SM 3500-Cr B Modified	JFP			1	PASI-M		
EPA 350.1	CLJ			1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V		
SM 4500-CN-E	DCL			1	PASI-M		
10468460003	M-1			EPA 8082A	RAG	11	PASI-M
				EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
		EPA 900.0	NEG	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10468460004	813768	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	IP	9	PASI-M
				EPA 200.8	RJS	12	PASI-M
				EPA 8270D	STB	38	PASI-M
	CLJ			16	PASI-V		
EPA 900.0	NEG			2	PASI-PA		

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10468460005	813767	EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
10468460006	813765	EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
		EPA 8082A	RAG	11	PASI-M
		EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813766	Lab ID: 10468460001	Collected: 03/27/19 10:40	Received: 03/27/19 16:17	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:02	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	31	%	30-125	1	03/28/19 16:19	04/01/19 13:02	877-09-8	
Decachlorobiphenyl (S)	32	%	30-125	1	03/28/19 16:19	04/01/19 13:02	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/28/19 05:53	04/01/19 12:40	7429-90-5	
Barium, Dissolved	662	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:40	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:40	7440-50-8	
Manganese, Dissolved	539	ug/L	5.0	1	03/28/19 05:53	04/01/19 12:40	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:40	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:40	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/28/19 05:53	04/01/19 12:40	7440-31-5	
Total Hardness by 2340B, Dissolved	782000	ug/L	3300	1	03/28/19 05:53	04/01/19 12:40		
Zinc, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:40	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:14	7440-36-0	
Arsenic, Dissolved	9.6	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:14	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/19 05:53	04/15/19 19:14	7440-41-7	
Boron, Dissolved	1200	ug/L	100	10	03/28/19 05:53	04/16/19 13:36	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/19 05:53	04/15/19 19:14	7440-43-9	
Chromium, Dissolved	0.61	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:14	7440-47-3	
Cobalt, Dissolved	4.5	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:14	7440-48-4	
Lead, Dissolved	0.15	ug/L	0.10	1	03/28/19 05:53	04/15/19 19:14	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:14	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/19 05:53	04/15/19 19:14	7440-28-0	
Uranium-238, Dissolved	1.2	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:14	7440-61-1	
Vanadium, Dissolved	2.1	ug/L	1.0	1	03/28/19 05:53	04/15/19 19:14	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	83-32-9	
Anthracene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	50-32-8	
Benzoic acid	ND	ug/L	49.3	1	03/28/19 16:02	04/02/19 14:43	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813766 **Lab ID: 10468460001** Collected: 03/27/19 10:40 Received: 03/27/19 16:17 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.3	1	03/28/19 16:02	04/02/19 14:43	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	120-83-2	
Diethylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	105-67-9	
Dimethylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	117-81-7	
Fluoranthene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	206-44-0	
Fluorene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	86-73-7	
Hexachlorobenzene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.3	1	03/28/19 16:02	04/02/19 14:43	77-47-4	
Hexachloroethane	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	67-72-1	
Isophorone	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.7	1	03/28/19 16:02	04/02/19 14:43		
N-Nitrosodimethylamine	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	62-75-9	
Pentachlorophenol	ND	ug/L	19.7	1	03/28/19 16:02	04/02/19 14:43	87-86-5	
Phenanthrene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	85-01-8	
Phenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	108-95-2	
Pyrene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 14:43	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	75	%.	55-125	1	03/28/19 16:02	04/02/19 14:43	4165-60-0	
2-Fluorobiphenyl (S)	78	%.	52-125	1	03/28/19 16:02	04/02/19 14:43	321-60-8	
p-Terphenyl-d14 (S)	78	%.	57-125	1	03/28/19 16:02	04/02/19 14:43	1718-51-0	
Phenol-d6 (S)	76	%.	30-125	1	03/28/19 16:02	04/02/19 14:43	13127-88-3	
2-Fluorophenol (S)	70	%.	30-125	1	03/28/19 16:02	04/02/19 14:43	367-12-4	
2,4,6-Tribromophenol (S)	96	%.	52-125	1	03/28/19 16:02	04/02/19 14:43	118-79-6	

Field Data

Analytical Method:

Collected Date	03/27/19			1		03/27/19 10:40		
Collected Time	1040			1		03/27/19 10:40		
Field Specific Conductance	1950	umhos/cm		1		03/27/19 10:40		
Oxygen, Dissolved	1.4	mg/L		1		03/27/19 10:40	7782-44-7	
REDOX	-54	mV		1		03/27/19 10:40		
Turbidity	91.0	NTU		1		03/27/19 10:40		
Apparent Color	slightly cloudy			1		03/27/19 10:40		
Odor	Yes			1		03/27/19 10:40		
Well Locked	Yes			1		03/27/19 10:40		
Purge Method	Disposable bailer			1		03/27/19 10:40		
Total Well Depth	39.24	feet		1		03/27/19 10:40		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813766		Lab ID: 10468460001		Collected: 03/27/19 10:40	Received: 03/27/19 16:17	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Depth of Water	31.45			1		03/27/19 10:40		
Well Volume Purged	3.9			1		03/27/19 10:40		
Purge Rate	NA			1		03/27/19 10:40		
Field pH	6.4	Std. Units		1		03/27/19 10:40		
Field Temperature	11.5	deg C		1		03/27/19 10:40		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	74.8	mg/L	1.2	1		03/28/19 19:05	16887-00-6	M1
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/28/19 11:10		FS,H5, M1
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/17/19 14:41		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	12.7	mg/L	0.22	2	04/02/19 10:00	04/03/19 10:41	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:30	57-12-5	

Sample: 813741		Lab ID: 10468460002		Collected: 03/27/19 11:40	Received: 03/27/19 16:17	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:17	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	70	%	30-125	1	03/28/19 16:19	04/01/19 13:17	877-09-8	
Decachlorobiphenyl (S)	50	%	30-125	1	03/28/19 16:19	04/01/19 13:17	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/28/19 05:53	04/01/19 12:45	7429-90-5	
Barium, Dissolved	2620	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:45	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:45	7440-50-8	
Manganese, Dissolved	91.3	ug/L	5.0	1	03/28/19 05:53	04/01/19 12:45	7439-96-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813741		Lab ID: 10468460002	Collected: 03/27/19 11:40	Received: 03/27/19 16:17	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Nickel, Dissolved	26.6	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:45	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:45	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/28/19 05:53	04/01/19 12:45	7440-31-5	
Total Hardness by 2340B, Dissolved	726000	ug/L	3300	1	03/28/19 05:53	04/01/19 12:45		
Zinc, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:45	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:19	7440-36-0	
Arsenic, Dissolved	16.1	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:19	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/19 05:53	04/15/19 19:19	7440-41-7	
Boron, Dissolved	5460	ug/L	1000	100	03/28/19 05:53	04/16/19 14:00	7440-42-8	M1,P6
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/19 05:53	04/15/19 19:19	7440-43-9	
Chromium, Dissolved	0.54	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:19	7440-47-3	
Cobalt, Dissolved	8.6	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:19	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/28/19 05:53	04/15/19 19:19	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:19	7782-49-2	
Thallium, Dissolved	0.31	ug/L	0.10	1	03/28/19 05:53	04/15/19 19:19	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:19	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/28/19 05:53	04/15/19 19:19	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	83-32-9	
Anthracene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	50-32-8	
Benzoic acid	ND	ug/L	50.0	1	03/28/19 16:02	04/02/19 15:08	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	111-44-4	
2-Chlorophenol	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	50.0	1	03/28/19 16:02	04/02/19 15:08	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	120-83-2	
Diethylphthalate	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	105-67-9	
Dimethylphthalate	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	117-81-7	
Fluoranthene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	206-44-0	
Fluorene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	86-73-7	
Hexachlorobenzene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	50.0	1	03/28/19 16:02	04/02/19 15:08	77-47-4	
Hexachloroethane	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	67-72-1	
Isophorone	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813741	Lab ID: 10468460002	Collected: 03/27/19 11:40	Received: 03/27/19 16:17	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.0	1	03/28/19 16:02	04/02/19 15:08		
N-Nitrosodimethylamine	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	62-75-9	
Pentachlorophenol	ND	ug/L	20.0	1	03/28/19 16:02	04/02/19 15:08	87-86-5	
Phenanthrene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	85-01-8	
Phenol	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	108-95-2	
Pyrene	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.0	1	03/28/19 16:02	04/02/19 15:08	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	77	%	55-125	1	03/28/19 16:02	04/02/19 15:08	4165-60-0	
2-Fluorobiphenyl (S)	80	%	52-125	1	03/28/19 16:02	04/02/19 15:08	321-60-8	
p-Terphenyl-d14 (S)	86	%	57-125	1	03/28/19 16:02	04/02/19 15:08	1718-51-0	
Phenol-d6 (S)	76	%	30-125	1	03/28/19 16:02	04/02/19 15:08	13127-88-3	
2-Fluorophenol (S)	70	%	30-125	1	03/28/19 16:02	04/02/19 15:08	367-12-4	
2,4,6-Tribromophenol (S)	99	%	52-125	1	03/28/19 16:02	04/02/19 15:08	118-79-6	
Field Data		Analytical Method:						
Collected Date	03/27/19			1		03/27/19 11:40		
Collected Time	1140			1		03/27/19 11:40		
Field Specific Conductance	1950	umhos/cm		1		03/27/19 11:40		
Oxygen, Dissolved	0.5	mg/L		1		03/27/19 11:40	7782-44-7	
REDOX	-43	mV		1		03/27/19 11:40		
Turbidity	31.8	NTU		1		03/27/19 11:40		
Apparent Color	clear			1		03/27/19 11:40		
Odor	No			1		03/27/19 11:40		
Well Locked	Yes			1		03/27/19 11:40		
Purge Method	Whale pump			1		03/27/19 11:40		
Total Well Depth	47.45	feet		1		03/27/19 11:40		
Depth of Water	37.43			1		03/27/19 11:40		
Well Volume Purged	6.0			1		03/27/19 11:40		
Purge Rate	0.5			1		03/27/19 11:40		
Field pH	6.5	Std. Units		1		03/27/19 11:40		
Field Temperature	11.5	deg C		1		03/27/19 11:40		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	134	mg/L	6.0	5		03/29/19 04:38	16887-00-6	M1
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/28/19 11:10		FS
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/17/19 14:43		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	9.4	mg/L	0.11	1	04/02/19 10:00	04/03/19 08:42	7664-41-7	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813741	Lab ID: 10468460002	Collected: 03/27/19 11:40	Received: 03/27/19 16:17	Matrix: Water
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Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
SM4500CN-E Cyanide Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:30	57-12-5	

Sample: M-1	Lab ID: 10468460003	Collected: 03/27/19 11:42	Received: 03/27/19 16:17	Matrix: Water
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Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								

PCB-1016 (Aroclor 1016)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 13:32	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	63	%	30-125	1	03/28/19 16:19	04/01/19 13:32	877-09-8	
Decachlorobiphenyl (S)	43	%	30-125	1	03/28/19 16:19	04/01/19 13:32	2051-24-3	

200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
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Aluminum, Dissolved	ND	ug/L	200	1	03/28/19 05:53	04/01/19 12:46	7429-90-5	
Barium, Dissolved	2610	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:46	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:46	7440-50-8	
Manganese, Dissolved	89.9	ug/L	5.0	1	03/28/19 05:53	04/01/19 12:46	7439-96-5	
Nickel, Dissolved	27.1	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:46	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:46	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/28/19 05:53	04/01/19 12:46	7440-31-5	
Total Hardness by 2340B, Dissolved	732000	ug/L	3300	1	03/28/19 05:53	04/01/19 12:46		
Zinc, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:46	7440-66-6	

200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
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Antimony, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:00	7440-36-0	
Arsenic, Dissolved	15.7	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:00	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/19 05:53	04/15/19 20:00	7440-41-7	
Boron, Dissolved	5300	ug/L	1000	100	03/28/19 05:53	04/16/19 14:09	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/19 05:53	04/15/19 20:00	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:00	7440-47-3	
Cobalt, Dissolved	8.7	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:00	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/28/19 05:53	04/15/19 20:00	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:00	7782-49-2	
Thallium, Dissolved	0.57	ug/L	0.10	1	03/28/19 05:53	04/15/19 20:00	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:00	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/28/19 05:53	04/15/19 20:00	7440-62-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: M-1	Lab ID: 10468460003	Collected: 03/27/19 11:42	Received: 03/27/19 16:17	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	83-32-9	
Anthracene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	50-32-8	
Benzoic acid	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 15:32	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	111-44-4	
2-Chlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 15:32	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	206-44-0	
Fluorene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 15:32	77-47-4	
Hexachloroethane	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	67-72-1	
Isophorone	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.6	1	03/28/19 16:02	04/02/19 15:32		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	62-75-9	
Pentachlorophenol	ND	ug/L	19.6	1	03/28/19 16:02	04/02/19 15:32	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	85-01-8	
Phenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	108-95-2	
Pyrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:32	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%	55-125	1	03/28/19 16:02	04/02/19 15:32	4165-60-0	
2-Fluorobiphenyl (S)	81	%	52-125	1	03/28/19 16:02	04/02/19 15:32	321-60-8	
p-Terphenyl-d14 (S)	82	%	57-125	1	03/28/19 16:02	04/02/19 15:32	1718-51-0	
Phenol-d6 (S)	76	%	30-125	1	03/28/19 16:02	04/02/19 15:32	13127-88-3	
2-Fluorophenol (S)	71	%	30-125	1	03/28/19 16:02	04/02/19 15:32	367-12-4	
2,4,6-Tribromophenol (S)	96	%	52-125	1	03/28/19 16:02	04/02/19 15:32	118-79-6	
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	134	mg/L	6.0	5		03/29/19 05:42	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	0.012	mg/L	0.010	1		03/28/19 11:10		FS

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: M-1		Lab ID: 10468460003	Collected: 03/27/19 11:42	Received: 03/27/19 16:17	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	9.6	mg/L	0.11	1	04/02/19 10:00	04/03/19 08:44	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:34	57-12-5	

Sample: 813768		Lab ID: 10468460004	Collected: 03/27/19 12:40	Received: 03/27/19 16:17	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 13:47	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	43	%	30-125	1	03/28/19 16:19	04/01/19 13:47	877-09-8	
Decachlorobiphenyl (S)	36	%	30-125	1	03/28/19 16:19	04/01/19 13:47	2051-24-3	

200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Aluminum, Dissolved	ND	ug/L	200	1	03/28/19 05:53	04/01/19 12:48	7429-90-5	
Barium, Dissolved	993	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:48	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:48	7440-50-8	
Manganese, Dissolved	452	ug/L	5.0	1	03/28/19 05:53	04/01/19 12:48	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:48	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:48	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/28/19 05:53	04/01/19 12:48	7440-31-5	
Total Hardness by 2340B, Dissolved	794000	ug/L	3300	1	03/28/19 05:53	04/01/19 12:48		
Zinc, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:48	7440-66-6	

200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Antimony, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:04	7440-36-0	
Arsenic, Dissolved	0.73	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:04	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/19 05:53	04/15/19 20:04	7440-41-7	
Boron, Dissolved	2590	ug/L	100	10	03/28/19 05:53	04/16/19 13:41	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/19 05:53	04/15/19 20:04	7440-43-9	
Chromium, Dissolved	3.5	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:04	7440-47-3	
Cobalt, Dissolved	0.86	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:04	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/28/19 05:53	04/15/19 20:04	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:04	7782-49-2	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813768	Lab ID: 10468460004	Collected: 03/27/19 12:40	Received: 03/27/19 16:17	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/19 05:53	04/15/19 20:04	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 20:04	7440-61-1	
Vanadium, Dissolved	1.3	ug/L	1.0	1	03/28/19 05:53	04/15/19 20:04	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	83-32-9	
Anthracene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	50-32-8	
Benzoic acid	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 15:56	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	111-44-4	
2-Chlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 15:56	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	206-44-0	
Fluorene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 15:56	77-47-4	
Hexachloroethane	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	67-72-1	
Isophorone	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.6	1	03/28/19 16:02	04/02/19 15:56		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	62-75-9	
Pentachlorophenol	ND	ug/L	19.6	1	03/28/19 16:02	04/02/19 15:56	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	85-01-8	
Phenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	108-95-2	
Pyrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 15:56	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	81	%	55-125	1	03/28/19 16:02	04/02/19 15:56	4165-60-0	
2-Fluorobiphenyl (S)	82	%	52-125	1	03/28/19 16:02	04/02/19 15:56	321-60-8	
p-Terphenyl-d14 (S)	84	%	57-125	1	03/28/19 16:02	04/02/19 15:56	1718-51-0	
Phenol-d6 (S)	81	%	30-125	1	03/28/19 16:02	04/02/19 15:56	13127-88-3	
2-Fluorophenol (S)	73	%	30-125	1	03/28/19 16:02	04/02/19 15:56	367-12-4	
2,4,6-Tribromophenol (S)	96	%	52-125	1	03/28/19 16:02	04/02/19 15:56	118-79-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813768	Lab ID: 10468460004	Collected: 03/27/19 12:40	Received: 03/27/19 16:17	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Field pH	6.3	Std. Units		1		03/27/19 12:40		
Field Temperature	11.5	deg C		1		03/27/19 12:40		
Collected Date	03/27/19			1		03/27/19 12:40		
Collected Time	1240			1		03/27/19 12:40		
Field Specific Conductance	1920	umhos/cm		1		03/27/19 12:40		
Oxygen, Dissolved	1.2	mg/L		1		03/27/19 12:40	7782-44-7	
REDOX	-82	mV		1		03/27/19 12:40		
Turbidity	3.5	NTU		1		03/27/19 12:40		
Apparent Color	clear			1		03/27/19 12:40		
Odor	No			1		03/27/19 12:40		
Well Locked	Yes			1		03/27/19 12:40		
Purge Method	Whale pump			1		03/27/19 12:40		
Total Well Depth	39.77	feet		1		03/27/19 12:40		
Depth of Water	18.41			1		03/27/19 12:40		
Well Volume Purged	10.5			1		03/27/19 12:40		
Purge Rate	0.5			1		03/27/19 12:40		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	26.9	mg/L	1.2	1		03/28/19 21:37	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	0.022	mg/L	0.010	1		03/28/19 11:10		FS
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.013	mg/L	0.010	1		04/17/19 14:46		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	31.4	mg/L	1.1	10	04/02/19 10:00	04/03/19 10:42	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	29.2	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:34	57-12-5	

Sample: 813767	Lab ID: 10468460005	Collected: 03/27/19 13:40	Received: 03/27/19 16:17	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	12674-11-2	
PCB-1221 (Aroclor 1221)	0.10	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	11096-82-5	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813767		Lab ID: 10468460005		Collected: 03/27/19 13:40		Received: 03/27/19 16:17		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C							
PCB-1262 (Aroclor 1262)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	37324-23-5		
PCB-1268 (Aroclor 1268)	ND	ug/L	0.097	1	03/28/19 16:19	04/01/19 14:03	11100-14-4		
Surrogates									
Tetrachloro-m-xylene (S)	31	%	30-125	1	03/28/19 16:19	04/01/19 14:03	877-09-8		
Decachlorobiphenyl (S)	18	%	30-125	1	03/28/19 16:19	04/01/19 14:03	2051-24-3	S0	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Aluminum, Dissolved	ND	ug/L	200	1	03/28/19 05:53	04/01/19 12:50	7429-90-5		
Barium, Dissolved	694	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:50	7440-39-3		
Copper, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:50	7440-50-8		
Manganese, Dissolved	220	ug/L	5.0	1	03/28/19 05:53	04/01/19 12:50	7439-96-5		
Nickel, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:50	7440-02-0		
Silver, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:50	7440-22-4		
Tin, Dissolved	ND	ug/L	75.0	1	03/28/19 05:53	04/01/19 12:50	7440-31-5		
Total Hardness by 2340B, Dissolved	816000	ug/L	3300	1	03/28/19 05:53	04/01/19 12:50			
Zinc, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:50	7440-66-6		
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:55	7440-36-0		
Arsenic, Dissolved	3.9	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:55	7440-38-2		
Beryllium, Dissolved	ND	ug/L	0.20	1	03/28/19 05:53	04/15/19 19:55	7440-41-7		
Boron, Dissolved	5040	ug/L	1000	100	03/28/19 05:53	04/16/19 14:14	7440-42-8		
Cadmium, Dissolved	ND	ug/L	0.080	1	03/28/19 05:53	04/15/19 19:55	7440-43-9		
Chromium, Dissolved	1.3	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:55	7440-47-3		
Cobalt, Dissolved	0.86	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:55	7440-48-4		
Lead, Dissolved	ND	ug/L	0.10	1	03/28/19 05:53	04/15/19 19:55	7439-92-1		
Selenium, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:55	7782-49-2		
Thallium, Dissolved	ND	ug/L	0.10	1	03/28/19 05:53	04/15/19 19:55	7440-28-0		
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/28/19 05:53	04/15/19 19:55	7440-61-1		
Vanadium, Dissolved	1.3	ug/L	1.0	1	03/28/19 05:53	04/15/19 19:55	7440-62-2		
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520							
Acenaphthene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	83-32-9		
Anthracene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	120-12-7		
Benzo(a)pyrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	50-32-8		
Benzoic acid	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 16:21	65-85-0		
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	101-55-3		
Butylbenzylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	85-68-7		
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	111-44-4		
2-Chlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	95-57-8		
3,3'-Dichlorobenzidine	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 16:21	91-94-1		
2,4-Dichlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	120-83-2		
Diethylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	84-66-2		
2,4-Dimethylphenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	105-67-9		
Dimethylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	131-11-3		
Di-n-butylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	84-74-2		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813767 Lab ID: 10468460005 Collected: 03/27/19 13:40 Received: 03/27/19 16:17 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2,4-Dinitrophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	206-44-0	
Fluorene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 16:21	77-47-4	
Hexachloroethane	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	67-72-1	
Isophorone	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.6	1	03/28/19 16:02	04/02/19 16:21		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	62-75-9	
Pentachlorophenol	ND	ug/L	19.6	1	03/28/19 16:02	04/02/19 16:21	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	85-01-8	
Phenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	108-95-2	
Pyrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 16:21	88-06-2	

Surrogates

Nitrobenzene-d5 (S)	81	%.	55-125	1	03/28/19 16:02	04/02/19 16:21	4165-60-0	
2-Fluorobiphenyl (S)	82	%.	52-125	1	03/28/19 16:02	04/02/19 16:21	321-60-8	
p-Terphenyl-d14 (S)	84	%.	57-125	1	03/28/19 16:02	04/02/19 16:21	1718-51-0	
Phenol-d6 (S)	79	%.	30-125	1	03/28/19 16:02	04/02/19 16:21	13127-88-3	
2-Fluorophenol (S)	73	%.	30-125	1	03/28/19 16:02	04/02/19 16:21	367-12-4	
2,4,6-Tribromophenol (S)	97	%.	52-125	1	03/28/19 16:02	04/02/19 16:21	118-79-6	

Field Data

Analytical Method:

Field pH	6.4	Std. Units		1		03/27/19 13:40		
Field Temperature	12.0	deg C		1		03/27/19 13:40		
Collected Date	03/27/19			1		03/27/19 13:40		
Collected Time	1340			1		03/27/19 13:40		
Field Specific Conductance	2270	umhos/cm		1		03/27/19 13:40		
Oxygen, Dissolved	1.0	mg/L		1		03/27/19 13:40	7782-44-7	
REDOX	-61	mV		1		03/27/19 13:40		
Turbidity	7.5	NTU		1		03/27/19 13:40		
Apparent Color	clear			1		03/27/19 13:40		
Odor	No			1		03/27/19 13:40		
Well Locked	Yes			1		03/27/19 13:40		
Purge Method	Whale pump			1		03/27/19 13:40		
Total Well Depth	38.73	feet		1		03/27/19 13:40		
Depth of Water	29.75			1		03/27/19 13:40		
Well Volume Purged	4.5			1		03/27/19 13:40		
Purge Rate	0.5			1		03/27/19 13:40		

300.0 IC Anions

Analytical Method: EPA 300.0

Chloride	112	mg/L		2.4	2	03/29/19 06:00	16887-00-6	
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813767		Lab ID: 10468460005		Collected: 03/27/19 13:40	Received: 03/27/19 16:17	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	0.023	mg/L	0.010	1		03/28/19 11:11		FS
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	0.017	mg/L	0.010	1		04/17/19 14:51		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	30.8	mg/L	1.1	10	04/02/19 10:00	04/03/19 10:43	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:35	57-12-5	

Sample: 813765 **Lab ID: 10468460006** Collected: 03/27/19 15:40 Received: 03/27/19 16:17 Matrix: Water
 Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	1.0	1	03/28/19 16:19	04/01/19 14:18	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	76	%	30-125	1	03/28/19 16:19	04/01/19 14:18	877-09-8	
Decachlorobiphenyl (S)	87	%	30-125	1	03/28/19 16:19	04/01/19 14:18	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/28/19 05:53	04/01/19 12:51	7429-90-5	
Barium, Dissolved	713	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:51	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:51	7440-50-8	
Manganese, Dissolved	318	ug/L	5.0	1	03/28/19 05:53	04/01/19 12:51	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:51	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/28/19 05:53	04/01/19 12:51	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/28/19 05:53	04/01/19 12:51	7440-31-5	
Total Hardness by 2340B, Dissolved	1190000	ug/L	3300	1	03/28/19 05:53	04/01/19 12:51		
Zinc, Dissolved	ND	ug/L	20.0	1	03/28/19 05:53	04/01/19 12:51	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	2.5	5	03/28/19 05:53	04/15/19 19:05	7440-36-0	D3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813765 **Lab ID: 10468460006** Collected: 03/27/19 15:40 Received: 03/27/19 16:17 Matrix: Water

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic, Dissolved	5.0	ug/L	2.5	5	03/28/19 05:53	04/15/19 19:05	7440-38-2	
Beryllium, Dissolved	ND	ug/L	1.0	5	03/28/19 05:53	04/15/19 19:05	7440-41-7	D3
Boron, Dissolved	2260	ug/L	250	25	03/28/19 05:53	04/16/19 13:32	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.40	5	03/28/19 05:53	04/15/19 19:05	7440-43-9	D3
Chromium, Dissolved	7.9	ug/L	2.5	5	03/28/19 05:53	04/15/19 19:05	7440-47-3	
Cobalt, Dissolved	11.8	ug/L	2.5	5	03/28/19 05:53	04/15/19 19:05	7440-48-4	
Lead, Dissolved	ND	ug/L	0.50	5	03/28/19 05:53	04/15/19 19:05	7439-92-1	D3
Selenium, Dissolved	ND	ug/L	2.5	5	03/28/19 05:53	04/15/19 19:05	7782-49-2	D3
Thallium, Dissolved	ND	ug/L	0.50	5	03/28/19 05:53	04/15/19 19:05	7440-28-0	D3
Uranium-238, Dissolved	ND	ug/L	2.5	5	03/28/19 05:53	04/15/19 19:05	7440-61-1	D3
Vanadium, Dissolved	5.6	ug/L	5.0	5	03/28/19 05:53	04/15/19 19:05	7440-62-2	

8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	83-32-9	
Anthracene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	120-12-7	
Benzo(a)pyrene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	50-32-8	
Benzoic acid	ND	ug/L	245	5	03/28/19 16:02	04/02/19 18:22	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	101-55-3	
Butylbenzylphthalate	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	111-44-4	
2-Chlorophenol	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	245	5	03/28/19 16:02	04/02/19 18:22	91-94-1	
2,4-Dichlorophenol	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	120-83-2	
Diethylphthalate	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	84-66-2	
2,4-Dimethylphenol	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	105-67-9	
Dimethylphthalate	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	131-11-3	
Di-n-butylphthalate	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	84-74-2	
2,4-Dinitrophenol	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	51-28-5	
Di-n-octylphthalate	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	117-81-7	
Fluoranthene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	206-44-0	
Fluorene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	86-73-7	
Hexachlorobenzene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	245	5	03/28/19 16:02	04/02/19 18:22	77-47-4	
Hexachloroethane	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	67-72-1	
Isophorone	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	78-59-1	
2-Methylnaphthalene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	98.0	5	03/28/19 16:02	04/02/19 18:22		
N-Nitrosodimethylamine	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	62-75-9	
Pentachlorophenol	ND	ug/L	98.0	5	03/28/19 16:02	04/02/19 18:22	87-86-5	
Phenanthrene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	85-01-8	
Phenol	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	108-95-2	
Pyrene	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	49.0	5	03/28/19 16:02	04/02/19 18:22	88-06-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Project No.: 10468460

Sample: 813765 **Lab ID: 10468460006** Collected: 03/27/19 15:40 Received: 03/27/19 16:17 Matrix: Water

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3520

Surrogates

Nitrobenzene-d5 (S)	91	%	55-125	5	03/28/19 16:02	04/02/19 18:22	4165-60-0	D3
2-Fluorobiphenyl (S)	89	%	52-125	5	03/28/19 16:02	04/02/19 18:22	321-60-8	
p-Terphenyl-d14 (S)	74	%	57-125	5	03/28/19 16:02	04/02/19 18:22	1718-51-0	
Phenol-d6 (S)	78	%	30-125	5	03/28/19 16:02	04/02/19 18:22	13127-88-3	
2-Fluorophenol (S)	77	%	30-125	5	03/28/19 16:02	04/02/19 18:22	367-12-4	
2,4,6-Tribromophenol (S)	91	%	52-125	5	03/28/19 16:02	04/02/19 18:22	118-79-6	

Field Data

Analytical Method:

Collected Date	03/27/19			1		03/27/19 15:40		
Collected Time	1540			1		03/27/19 15:40		
Field Specific Conductance	6960	umhos/cm		1		03/27/19 15:40		
Oxygen, Dissolved	0.8	mg/L		1		03/27/19 15:40	7782-44-7	
REDOX	-137	mV		1		03/27/19 15:40		
Turbidity	57.5	NTU		1		03/27/19 15:40		
Apparent Color	gray			1		03/27/19 15:40		
Odor	Yes			1		03/27/19 15:40		
Well Locked	Yes			1		03/27/19 15:40		
Purge Method	Whale pump			1		03/27/19 15:40		
Total Well Depth	44.19	feet		1		03/27/19 15:40		
Depth of Water	29.00			1		03/27/19 15:40		
Well Volume Purged	7.5			1		03/27/19 15:40		
Purge Rate	0.5			1		03/27/19 15:40		
Field pH	6.9	Std. Units		1		03/27/19 15:40		
Field Temperature	12.0	deg C		1		03/27/19 15:40		

300.0 IC Anions Analytical Method: EPA 300.0

Chloride	1040	mg/L	24.0	20		03/29/19 03:45	16887-00-6	
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Chromium, Hexavalent Analytical Method: SM 3500-Cr B Modified

Chromium, Hexavalent	ND	mg/L	0.010	1		03/28/19 11:11		FS
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350.1 Ammonia, Unionized Analytical Method: EPA 350.1

Nitrogen, Ammonia (Unionized)	0.51	mg/L	0.010	1		04/17/19 14:53		
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350.1 Ammonia, Distilled Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)

Nitrogen, Ammonia	296	mg/L	5.5	10	04/02/19 10:00	04/03/19 10:45	7664-41-7	
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SM4500CN-E Cyanide Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E

Cyanide	ND	ug/L	20.0	1	04/08/19 09:52	04/08/19 13:35	57-12-5	
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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468460

QC Batch: 596133 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 3223063 Matrix: Water
Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/01/19 12:36	
Barium, Dissolved	ug/L	ND	10.0	04/01/19 12:36	
Copper, Dissolved	ug/L	ND	10.0	04/01/19 12:36	
Manganese, Dissolved	ug/L	ND	5.0	04/01/19 12:36	
Nickel, Dissolved	ug/L	ND	20.0	04/01/19 12:36	
Silver, Dissolved	ug/L	ND	10.0	04/01/19 12:36	
Tin, Dissolved	ug/L	ND	75.0	04/01/19 12:36	
Zinc, Dissolved	ug/L	ND	20.0	04/01/19 12:36	

LABORATORY CONTROL SAMPLE: 3223064

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21200	106	85-115	
Barium, Dissolved	ug/L	1000	1020	102	85-115	
Copper, Dissolved	ug/L	1000	977	98	85-115	
Manganese, Dissolved	ug/L	1000	1020	102	85-115	
Nickel, Dissolved	ug/L	1000	1010	101	85-115	
Silver, Dissolved	ug/L	500	515	103	85-115	
Tin, Dissolved	ug/L	1000	1040	104	85-115	
Zinc, Dissolved	ug/L	1000	1030	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3223065 3223066

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10468460001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	22100	22000	111	110	70-130	1	20
Barium, Dissolved	ug/L	662	1000	1000	1720	1690	106	103	70-130	2	20
Copper, Dissolved	ug/L	ND	1000	1000	1040	1030	104	103	70-130	1	20
Manganese, Dissolved	ug/L	539	1000	1000	1580	1580	104	104	70-130	0	20
Nickel, Dissolved	ug/L	ND	1000	1000	1000	992	99	99	70-130	1	20
Silver, Dissolved	ug/L	ND	500	500	546	541	109	108	70-130	1	20
Tin, Dissolved	ug/L	ND	1000	1000	1030	1020	103	102	70-130	1	20
Zinc, Dissolved	ug/L	ND	1000	1000	991	981	99	98	70-130	1	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

QC Batch: 596137 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
 Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 3223085 Matrix: Water
 Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/15/19 19:01	
Arsenic, Dissolved	ug/L	ND	0.50	04/15/19 19:01	
Beryllium, Dissolved	ug/L	ND	0.20	04/15/19 19:01	
Boron, Dissolved	ug/L	ND	10.0	04/15/19 19:01	
Cadmium, Dissolved	ug/L	ND	0.080	04/15/19 19:01	
Chromium, Dissolved	ug/L	ND	0.50	04/15/19 19:01	
Cobalt, Dissolved	ug/L	ND	0.50	04/15/19 19:01	
Lead, Dissolved	ug/L	ND	0.10	04/15/19 19:01	
Selenium, Dissolved	ug/L	ND	0.50	04/15/19 19:01	
Thallium, Dissolved	ug/L	ND	0.10	04/15/19 19:01	
Uranium-238, Dissolved	ug/L	ND	0.50	04/15/19 19:01	
Vanadium, Dissolved	ug/L	ND	1.0	04/15/19 19:01	

LABORATORY CONTROL SAMPLE: 3223086

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.1	99	85-115	
Arsenic, Dissolved	ug/L	100	95.5	96	85-115	
Beryllium, Dissolved	ug/L	100	98.5	98	85-115	
Boron, Dissolved	ug/L	100	106	106	85-115	
Cadmium, Dissolved	ug/L	100	97.8	98	85-115	
Chromium, Dissolved	ug/L	100	99.8	100	85-115	
Cobalt, Dissolved	ug/L	100	98.5	98	85-115	
Lead, Dissolved	ug/L	100	103	103	85-115	
Selenium, Dissolved	ug/L	100	98.2	98	85-115	
Thallium, Dissolved	ug/L	100	96.8	97	85-115	
Uranium-238, Dissolved	ug/L	100	103	103	85-115	
Vanadium, Dissolved	ug/L	100	98.5	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3223087 3223088

Parameter	Units	10468460002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Antimony, Dissolved	ug/L	ND	100	100	97.8	96.4	98	96	70-130	2	20	
Arsenic, Dissolved	ug/L	16.1	100	100	113	110	97	94	70-130	3	20	
Beryllium, Dissolved	ug/L	ND	100	100	94.0	90.7	94	91	70-130	4	20	
Boron, Dissolved	ug/L	5460	100	100	5650	5600	186	136	70-130	1	20	CH,E, M1,P6

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Parameter	Units	3223087		3223088		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Cadmium, Dissolved	ug/L	ND	100	100	93.0	89.7	93	90	70-130	4	20	
Chromium, Dissolved	ug/L	0.54	100	100	99.6	96.0	99	95	70-130	4	20	
Cobalt, Dissolved	ug/L	8.6	100	100	109	107	101	98	70-130	2	20	
Lead, Dissolved	ug/L	ND	100	100	96.7	92.8	97	93	70-130	4	20	
Selenium, Dissolved	ug/L	ND	100	100	94.3	90.4	94	90	70-130	4	20	
Thallium, Dissolved	ug/L	0.31	100	100	92.9	89.4	93	89	70-130	4	20	
Uranium-238, Dissolved	ug/L	ND	100	100	105	101	104	100	70-130	4	20	
Vanadium, Dissolved	ug/L	ND	100	100	102	97.8	102	97	70-130	4	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468460

QC Batch: 596214 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 3223517 Matrix: Water
Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/01/19 12:31	
Decachlorobiphenyl (S)	%	92	30-125	04/01/19 12:31	
Tetrachloro-m-xylene (S)	%	81	30-125	04/01/19 12:31	

LABORATORY CONTROL SAMPLE & LCSD: 3223518

Parameter	Units	3223518		3223519		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.6	81	81	45-125	0	20
PCB-1260 (Aroclor 1260)	ug/L	2	1.9	1.8	97	92	49-125	5	20
Decachlorobiphenyl (S)	%				102	95	30-125		
Tetrachloro-m-xylene (S)	%				58	61	30-125		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

QC Batch: 596311 Analysis Method: EPA 8270D
 QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
 Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 3223890 Matrix: Water
 Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/02/19 13:06	
2,4-Dichlorophenol	ug/L	ND	10.0	04/02/19 13:06	
2,4-Dimethylphenol	ug/L	ND	10.0	04/02/19 13:06	
2,4-Dinitrophenol	ug/L	ND	10.0	04/02/19 13:06	
2-Chlorophenol	ug/L	ND	10.0	04/02/19 13:06	
2-Methylnaphthalene	ug/L	ND	10.0	04/02/19 13:06	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/02/19 13:06	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/02/19 13:06	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/02/19 13:06	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/02/19 13:06	
Acenaphthene	ug/L	ND	10.0	04/02/19 13:06	
Anthracene	ug/L	ND	10.0	04/02/19 13:06	
Benzo(a)pyrene	ug/L	ND	10.0	04/02/19 13:06	
Benzoic acid	ug/L	ND	50.0	04/02/19 13:06	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/02/19 13:06	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/02/19 13:06	
Butylbenzylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Di-n-butylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Di-n-octylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Diethylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Dimethylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Fluoranthene	ug/L	ND	10.0	04/02/19 13:06	
Fluorene	ug/L	ND	10.0	04/02/19 13:06	
Hexachlorobenzene	ug/L	ND	10.0	04/02/19 13:06	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/02/19 13:06	
Hexachloroethane	ug/L	ND	10.0	04/02/19 13:06	
Isophorone	ug/L	ND	10.0	04/02/19 13:06	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/02/19 13:06	
Pentachlorophenol	ug/L	ND	20.0	04/02/19 13:06	
Phenanthrene	ug/L	ND	10.0	04/02/19 13:06	
Phenol	ug/L	ND	10.0	04/02/19 13:06	
Pyrene	ug/L	ND	10.0	04/02/19 13:06	
2,4,6-Tribromophenol (S)	%	88	52-125	04/02/19 13:06	
2-Fluorobiphenyl (S)	%	73	52-125	04/02/19 13:06	
2-Fluorophenol (S)	%	69	30-125	04/02/19 13:06	
Nitrobenzene-d5 (S)	%	74	55-125	04/02/19 13:06	
p-Terphenyl-d14 (S)	%	86	57-125	04/02/19 13:06	
Phenol-d6 (S)	%	73	30-125	04/02/19 13:06	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468460

LABORATORY CONTROL SAMPLE & LCSD: 3223891		3223892									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	42.7	42.8	85	86	60-125	0	20		
2,4-Dichlorophenol	ug/L	50	39.2	37.7	78	75	56-125	4	20		
2,4-Dimethylphenol	ug/L	50	33.1	32.5	66	65	33-125	2	20		
2,4-Dinitrophenol	ug/L	50	31.8	32.7	64	65	32-125	3	20		
2-Chlorophenol	ug/L	50	37.6	35.1	75	70	52-125	7	20		
2-Methylnaphthalene	ug/L	50	39.0	38.3	78	77	52-125	2	20		
2-Methylphenol(o-Cresol)	ug/L	50	36.9	34.4	74	69	55-125	7	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.5	35.1	75	70	57-125	7	20		
3,3'-Dichlorobenzidine	ug/L	50	44J	44J	88	88	39-150		20		
4-Bromophenylphenyl ether	ug/L	50	46.4	45.7	93	91	61-125	1	20		
Acenaphthene	ug/L	50	43.0	43.0	86	86	59-125	0	20		
Anthracene	ug/L	50	47.3	46.5	95	93	64-125	2	20		
Benzo(a)pyrene	ug/L	50	43.9	43.8	88	88	63-125	0	20		
Benzoic acid	ug/L	50	33.5J	26.9J	67	54	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	37.3	35.1	75	70	49-125	6	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	45.6	46.2	91	92	68-125	1	20		
Butylbenzylphthalate	ug/L	50	46.1	45.6	92	91	67-125	1	20		
Di-n-butylphthalate	ug/L	50	49.3	47.7	99	95	67-125	3	20		
Di-n-octylphthalate	ug/L	50	46.0	46.4	92	93	67-125	1	20		
Diethylphthalate	ug/L	50	47.3	46.0	95	92	64-125	3	20		
Dimethylphthalate	ug/L	50	46.9	45.5	94	91	65-125	3	20		
Fluoranthene	ug/L	50	47.3	47.2	95	94	64-125	0	20		
Fluorene	ug/L	50	45.3	44.8	91	90	63-125	1	20		
Hexachlorobenzene	ug/L	50	48.4	49.2	97	98	61-125	2	20		
Hexachlorocyclopentadiene	ug/L	50	21.3J	ND	43	40	30-125		20		
Hexachloroethane	ug/L	50	34.5	32.3	69	65	30-125	6	20		
Isophorone	ug/L	50	41.4	40.7	83	81	59-125	2	20		
N-Nitrosodimethylamine	ug/L	50	38.6	35.5	77	71	43-125	8	20		
Pentachlorophenol	ug/L	50	43.3	41.7	87	83	35-125	4	20		
Phenanthrene	ug/L	50	46.4	46.2	93	92	65-125	0	20		
Phenol	ug/L	50	37.7	34.9	75	70	54-125	8	20		
Pyrene	ug/L	50	44.5	44.2	89	88	65-125	1	20		
2,4,6-Tribromophenol (S)	%				96	95	52-125				
2-Fluorobiphenyl (S)	%				79	78	52-125				
2-Fluorophenol (S)	%				72	68	30-125				
Nitrobenzene-d5 (S)	%				77	73	55-125				
p-Terphenyl-d14 (S)	%				85	84	57-125				
Phenol-d6 (S)	%				74	69	30-125				

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

QC Batch: 596271 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 3223718 Matrix: Water
 Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	03/28/19 16:38	

LABORATORY CONTROL SAMPLE: 3223719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.9	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3223720 3223721

Parameter	Units	10468460001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Chloride	mg/L	74.8	62.5	62.5	128	129	86	86	90-110	0	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3223722 3223723

Parameter	Units	10468460002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Chloride	mg/L	134	62.5	62.5	191	188	90	86	90-110	1	20	M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468460

QC Batch: 596221 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 3223534 Matrix: Water
Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/28/19 11:10	FS

LABORATORY CONTROL SAMPLE: 3223535

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	96	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3223536 3223537

Parameter	Units	10468460001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/L	ND	0.2	0.2	0.11	0.13	49	60	85-115	17	20	FS,H5, M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

QC Batch: 163578 Analysis Method: EPA 350.1 rev. 2 (1993)
 QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
 Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 644687 Matrix: Water
 Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	04/03/19 08:35	

LABORATORY CONTROL SAMPLE: 644688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 644689 644690

Parameter	Units	12123082002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	<0.11	5	5	5.2	5.0	103	101	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 644691 644692

Parameter	Units	10468606003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	6.3	5	5	11.2	11.4	97	101	90-110	2	10	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468460

QC Batch: 598088 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 3234106 Matrix: Water
Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/08/19 13:09	

LABORATORY CONTROL SAMPLE: 3234107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	249	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3234108 3234109

Parameter	Units	10468668002 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	ND	250	250	209	226	76	83	80-120	8	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3234110 3234111

Parameter	Units	10468315002 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Cyanide	ug/L	ND	250	250	232	229	88	87	80-120	1	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813766 **Lab ID: 10468460001** Collected: 03/27/19 10:40 Received: 03/27/19 16:17 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	7.46 ± 3.33 (4.50) C:NA T:NA	pCi/L	04/02/19 19:35	12587-46-1	
Gross Beta	EPA 900.0	34.9 ± 7.68 (6.19) C:NA T:NA	pCi/L	04/02/19 19:35	12587-47-2	

Sample: 813741 **Lab ID: 10468460002** Collected: 03/27/19 11:40 Received: 03/27/19 16:17 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	20.9 ± 6.20 (5.42) C:NA T:NA	pCi/L	04/02/19 18:07	12587-46-1	
Gross Beta	EPA 900.0	24.8 ± 5.91 (5.15) C:NA T:NA	pCi/L	04/02/19 18:07	12587-47-2	

Sample: M-1 **Lab ID: 10468460003** Collected: 03/27/19 11:42 Received: 03/27/19 16:17 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	20.4 ± 6.59 (4.82) C:NA T:NA	pCi/L	04/03/19 08:21	12587-46-1	
Gross Beta	EPA 900.0	36.6 ± 8.36 (6.20) C:NA T:NA	pCi/L	04/03/19 08:21	12587-47-2	

Sample: 813768 **Lab ID: 10468460004** Collected: 03/27/19 12:40 Received: 03/27/19 16:17 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	8.97 ± 4.34 (5.36) C:NA T:NA	pCi/L	04/03/19 08:21	12587-46-1	
Gross Beta	EPA 900.0	31.0 ± 7.52 (6.82) C:NA T:NA	pCi/L	04/03/19 08:21	12587-47-2	

Sample: 813767 **Lab ID: 10468460005** Collected: 03/27/19 13:40 Received: 03/27/19 16:17 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	5.83 ± 3.81 (5.70) C:NA T:NA	pCi/L	04/03/19 08:22	12587-46-1	
Gross Beta	EPA 900.0	32.6 ± 7.93 (7.11) C:NA T:NA	pCi/L	04/03/19 08:22	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Sample: 813765 **Lab ID: 10468460006** Collected: 03/27/19 15:40 Received: 03/27/19 16:17 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	12.4 ± 12.7 (23.8) C:NA T:NA	pCi/L	04/03/19 08:22	12587-46-1	
Gross Beta	EPA 900.0	238 ± 49.6 (27.8) C:NA T:NA	pCi/L	04/03/19 08:22	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

QC Batch: 336388 Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0 Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

METHOD BLANK: 1637116 Matrix: Water

Associated Lab Samples: 10468460001, 10468460002, 10468460003, 10468460004, 10468460005, 10468460006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.490 ± 0.775 (1.71) C:NA T:NA	pCi/L	04/03/19 08:03	
Gross Beta	-0.139 ± 0.741 (1.85) C:NA T:NA	pCi/L	04/03/19 08:03	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468460

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10468460
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 596776
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

ANALYTE QUALIFIERS

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
FS	The sample was filtered in the laboratory prior to analysis.
H5	Reanalysis conducted in excess of EPA method holding time. Results confirm original analysis performed in hold time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
S0	Surrogate recovery outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10468460001	813766	EPA Mod. 3510C	596214	EPA 8082A	596776
10468460002	813741	EPA Mod. 3510C	596214	EPA 8082A	596776
10468460003	M-1	EPA Mod. 3510C	596214	EPA 8082A	596776
10468460004	813768	EPA Mod. 3510C	596214	EPA 8082A	596776
10468460005	813767	EPA Mod. 3510C	596214	EPA 8082A	596776
10468460006	813765	EPA Mod. 3510C	596214	EPA 8082A	596776
10468460001	813766	EPA 200.7	596133	EPA 200.7	596268
10468460002	813741	EPA 200.7	596133	EPA 200.7	596268
10468460003	M-1	EPA 200.7	596133	EPA 200.7	596268
10468460004	813768	EPA 200.7	596133	EPA 200.7	596268
10468460005	813767	EPA 200.7	596133	EPA 200.7	596268
10468460006	813765	EPA 200.7	596133	EPA 200.7	596268
10468460001	813766	EPA 200.8	596137	EPA 200.8	596845
10468460002	813741	EPA 200.8	596137	EPA 200.8	596845
10468460003	M-1	EPA 200.8	596137	EPA 200.8	596845
10468460004	813768	EPA 200.8	596137	EPA 200.8	596845
10468460005	813767	EPA 200.8	596137	EPA 200.8	596845
10468460006	813765	EPA 200.8	596137	EPA 200.8	596845
10468460001	813766	EPA 3520	596311	EPA 8270D	596901
10468460002	813741	EPA 3520	596311	EPA 8270D	596901
10468460003	M-1	EPA 3520	596311	EPA 8270D	596901
10468460004	813768	EPA 3520	596311	EPA 8270D	596901
10468460005	813767	EPA 3520	596311	EPA 8270D	596901
10468460006	813765	EPA 3520	596311	EPA 8270D	596901
10468460001	813766				
10468460002	813741				
10468460004	813768				
10468460005	813767				
10468460006	813765				
10468460001	813766	EPA 900.0	336388		
10468460002	813741	EPA 900.0	336388		
10468460003	M-1	EPA 900.0	336388		
10468460004	813768	EPA 900.0	336388		
10468460005	813767	EPA 900.0	336388		
10468460006	813765	EPA 900.0	336388		
10468460001	813766	EPA 300.0	596271		
10468460002	813741	EPA 300.0	596271		
10468460003	M-1	EPA 300.0	596271		
10468460004	813768	EPA 300.0	596271		
10468460005	813767	EPA 300.0	596271		
10468460006	813765	EPA 300.0	596271		
10468460001	813766	SM 3500-Cr B Modified	596221		
10468460002	813741	SM 3500-Cr B Modified	596221		
10468460003	M-1	SM 3500-Cr B Modified	596221		
10468460004	813768	SM 3500-Cr B Modified	596221		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10468460005	813767	SM 3500-Cr B Modified	596221		
10468460006	813765	SM 3500-Cr B Modified	596221		
10468460001	813766	EPA 350.1			
10468460002	813741	EPA 350.1			
10468460004	813768	EPA 350.1			
10468460005	813767	EPA 350.1			
10468460006	813765	EPA 350.1			
10468460001	813766	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468460002	813741	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468460003	M-1	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468460004	813768	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468460005	813767	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468460006	813765	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468460001	813766	SM 4500-CN-E	598088	SM 4500-CN-E	598190
10468460002	813741	SM 4500-CN-E	598088	SM 4500-CN-E	598190
10468460003	M-1	SM 4500-CN-E	598088	SM 4500-CN-E	598190
10468460004	813768	SM 4500-CN-E	598088	SM 4500-CN-E	598190
10468460005	813767	SM 4500-CN-E	598088	SM 4500-CN-E	598190
10468460006	813765	SM 4500-CN-E	598088	SM 4500-CN-E	598190

REPORT OF LABORATORY ANALYSIS

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Minnesota Pollution Control Agency

Chain-of-Custody Form revised 2011.0909

Work Order Number:

COC Type:

Page: 1 of 1

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MNSW-057

Program Code (MDH Lab Only):

Lab Name:

Pace Analytical - Minneapolis, MN

Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters

Project Task Code: PRJ07786

Address: 1700 SE Elm Street

Project Manager: Brad Jacobson

612-607-6375

EPIC PROFILE #: 38716 Line 2

Minneapolis

MN

55414

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample-Routine Sample
S-IVP-Integrated Vertical Profile Sample
S-CWOP-Composite Sample

QC-FB-Field Blank Sample
QC-FR-Field Replicate Sample
QC-TB-Trip Blank Sample

LAB MATRIX CODES

DW-Drinking Water
NW-Non-potable Water
SD-Soil/Solid
WP-Wipe

AR-Air
BL-Biological Material
OT-Other
TS-Tissue

FIELD MATRIX CODES

Wtr-Ground-Groundwater
Wtr-Surf-Surface Water
QC-BLANK-Artificial Blank Water
Leachate-Leachate Sample

PRESERV.

None

HNO3

None

H2SO4

NaOH

None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/Un-ionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SYOC, 8082, MDA1, MDA2 - QAPP Table 3a	Lab Sample No.	#
813766	Sample	3/27/19	1040			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X			1
813741	Sample	3/27/19	1140			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X			2
M-1	QC-FR	3/27/19	1142			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X			3
813768	Sample	3/27/19	1240			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X			4
813767	Sample	3/27/19	1340			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X			5
813765	Sample	3/27/19	1540			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X			6
									N											
									N											
									N											
									N											

WO# 10468460

10468460

Sampled By: David Anderson / Chris Pelosi

Sampler's Signature: David Anderson / Chris Pelosi

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	3/27/19 / 1600	Chris Pelosi	3/27/19 / 16:17

T= 5.9, 4.3, 5.7, 5.7, 6.2, 10.0

Sample Condition Upon Receipt

Client Name: Basi, Field

Project #: **WO#: 10468460**

PM: JMA

Due Date: 04/03/19

CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Pace SpeeDee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: G87A9155100842 G87A9170600254 Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>5.9, 4.3, 5.7, 5.7, 6.2, 10.0</u> °C	Average Corrected Temp (no temp blank only): _____ °C	See Exceptions <input type="checkbox"/>
Correction Factor: <u>Time</u>	Cooler Temp Corrected w/temp blank: <u>5.9, 4.3, 5.7, 5.7, 6.2, 10.0</u> °C		

USDA Regulated Soil: (N/A, water sample/Other: _____)

Date/Initials of Person Examining Contents: CLJ 3/27/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: _____ See Exception <input type="checkbox"/>
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>1-6</u> <u>3/2</u> <input checked="" type="checkbox"/> NaOH <u>1/1</u> <input checked="" type="checkbox"/> HNO ₃ <u>1/1</u> <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Positive for Res. Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No See Exception <input type="checkbox"/>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): _____
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____

Date/Time: _____

Field Data Required? Yes No

Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 03/28/2019

Note: Whenever there is a discrepancy on testing North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: [Signature]

WO#: 12123002



12123002

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Owner Received Date: 3/27/2019 Results Requested By: 4/17/2019

Workorder: 10468460 Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Report To		Subcontract To					Requested Analysis																																			
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<table border="1"> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>																																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers																																				
						H2SO4 BP3S																																				
1	813766	PS	3/27/2019 10:40	10468460001	Water	1																																				
2	813741	PS	3/27/2019 11:40	10468460002	Water	1																																				
3	M-1	PS	3/27/2019 11:42	10468460003	Water	1																																				
4	813768	PS	3/27/2019 12:40	10468460004	Water	1																																				
5	813767	PS	3/27/2019 13:40	10468460005	Water	1																																				
6	813765	PS	3/27/2019 15:40	10468460006	Water	1																																				

Transfers	Released By	Date/Time	Received By	Date/Time	Comments			
1	<i>[Signature]</i>	3/28/19 1655	<i>[Signature]</i>	3/28/19 1845				
2	<i>[Signature]</i>	3/28/19 2330	<i>[Signature]</i>	3/29/19 08:00				
3								

Cooler Temperature on Receipt 1.3 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
 F-VM-C-001-Rev.10

Document Revised: 15Mar2016
 Page 1 of 1
 Issuing Authority:
 Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO#: 12123002
 PM: CLJ Due Date: 04/18/19
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: _____ Date and Initials of Person Examining Contents: 3/28/19, DL

Comments: RT 3/29/19

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Carrigan Date: 3/29/19
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN
 Cert. Needed: Yes No
 Owner Received Date: 3/27/2019 Results Requested By: 4/17/2019

Workorder: 10468460 Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Report To		Subcontract To						Requested Analysis											
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600						<div style="font-size: 24pt; font-weight: bold;">WO#: 30286816</div> <div style="font-weight: bold;">30286816</div>											
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Gross Alpha/Beta	LAB USE ONLY							
						MPC	1	2	3	4		5	6	7	8	9	10		
1	813766	PS	3/27/2019 10:40	10468460001	Water	1					X								061
2	813741	PS	3/27/2019 11:40	10468460002	Water	1					X								062
3	M-1	PS	3/27/2019 11:42	10468460003	Water	1					X								063
4	813768	PS	3/27/2019 12:40	10468460004	Water	1					X								064
5	813767	PS	3/27/2019 13:40	10468460005	Water	1					X								065
6	813765	PS	3/27/2019 15:40	10468460006	Water	1					X								066
Transfers												Comments							
Released By	Date/Time	Received By	Date/Time																
<i>[Signature]</i>	3/27/2019 15:25	<i>[Signature]</i>	3-29-19	0945															
Cooler Temperature on Receipt N/A °C		Custody Seal <input checked="" type="radio"/> Y or N			Received on Ice Y or <input checked="" type="radio"/> N					Samples Intact <input checked="" type="radio"/> Y or N									

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace MIN

Project # 30286816

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4638 0195 6067

Label	<u>ET</u>
LIMS Login	<u>ET</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature _____ Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>1052981</u>	<u>ET 3-29-19</u>
Chain of Custody Present:	/				
Chain of Custody Filled Out:	/				
Chain of Custody Relinquished:	/				
Sampler Name & Signature on COC:	/				
Sample Labels match COC:	/				
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	/				
Short Hold Time Analysis (<72hr remaining):		/			
Rush Turn Around Time Requested:	/				
Sufficient Volume:	/				
Correct Containers Used:	/				
-Pace Containers Used:	/				
Containers Intact:	/				
Orthophosphate field filtered			/		
Hex Cr Aqueous Compliance/NPDES sample field filtered			/		
Organic Samples checked for dechlorination:			/		
Filtered volume received for Dissolved tests			/		
All containers have been checked for preservation.	/				
All containers needing preservation are found to be in compliance with EPA recommendation.		/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ET</u>	Date/time of preservation: <u>3-29-19 2213</u>
				Lot # of added preservative: <u>DL101-02360</u>	
Headspace in VOA Vials (>6mm):			/		
Trip Blank Present:			/		
Trip Blank Custody Seals Present			/		
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>ET</u>	Date: <u>3-29-19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



12-Apr-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10468460**

Work Order: **19031664**

Dear Jennifer,

ALS Environmental received 6 samples on 29-Mar-2019 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 13.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a faint, larger version of the same signature.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10468460
Work Order: 19031664

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
19031664-01	813766	Water		3/27/2019 10:40	3/29/2019 09:30	<input type="checkbox"/>
19031664-02	813741	Water		3/27/2019 11:40	3/29/2019 09:30	<input type="checkbox"/>
19031664-03	M-1	Water		3/27/2019 11:42	3/29/2019 09:30	<input type="checkbox"/>
19031664-04	813768	Water		3/27/2019 12:40	3/29/2019 09:30	<input type="checkbox"/>
19031664-05	813767	Water		3/27/2019 13:40	3/29/2019 09:30	<input type="checkbox"/>
19031664-06	813765	Water		3/27/2019 15:40	3/29/2019 09:30	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10468460
WorkOrder: 19031664

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468460

Work Order: 19031664

Sample ID: 813766

Lab ID: 19031664-01

Collection Date: 3/27/2019 10:40 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/5/2019 02:10 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468460

Work Order: 19031664

Sample ID: 813741

Lab ID: 19031664-02

Collection Date: 3/27/2019 11:40 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/5/2019 02:10 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468460

Work Order: 19031664

Sample ID: M-1

Lab ID: 19031664-03

Collection Date: 3/27/2019 11:42 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/5/2019 02:10 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC
Project: 10468460
Sample ID: 813768
Collection Date: 3/27/2019 12:40 PM

Work Order: 19031664
Lab ID: 19031664-04
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE Cyanide, Free	ND		SW9014 20	µg/L	1	Analyst: RZM 4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468460

Work Order: 19031664

Sample ID: 813767

Lab ID: 19031664-05

Collection Date: 3/27/2019 01:40 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468460

Work Order: 19031664

Sample ID: 813765

Lab ID: 19031664-06

Collection Date: 3/27/2019 03:40 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 19031664
Project: 10468460

QC BATCH REPORT

Batch ID: **R257895** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R257895-R257895				Units: µg/L		Analysis Date: 4/5/2019 02:10 PM		
Client ID:		Run ID: WETCHEM_190405G		SeqNo: 5593578		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free ND 20

LCS		Sample ID: LCS-R257895-R257895				Units: µg/L		Analysis Date: 4/5/2019 02:10 PM		
Client ID:		Run ID: WETCHEM_190405G		SeqNo: 5593579		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 272.1 20 250 0 109 81-119 0

MS		Sample ID: 19031541-01A MS				Units: µg/L		Analysis Date: 4/5/2019 02:10 PM		
Client ID:		Run ID: WETCHEM_190405G		SeqNo: 5593581		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 256.1 20 250 -9.96 106 81-119 0

MSD		Sample ID: 19031541-01A MSD				Units: µg/L		Analysis Date: 4/5/2019 02:10 PM		
Client ID:		Run ID: WETCHEM_190405G		SeqNo: 5593582		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 251.7 20 250 -9.96 105 81-119 256.1 1.72 20

The following samples were analyzed in this batch:

19031664-01A	19031664-02A	19031664-03A
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Client: Pace Analytical Services, LLC
Work Order: 19031664
Project: 10468460

QC BATCH REPORT

Batch ID: **R258103** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R258103-R258103				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q				SeqNo: 5596554		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	ND	20								

LCS		Sample ID: LCS-R258103-R258103				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q				SeqNo: 5596555		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	264.9	20	250	0	106	81-119	0			

MS		Sample ID: 1904010-01A MS				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q				SeqNo: 5596560		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	264.9	20	250	-6.48	109	81-119	0			

MSD		Sample ID: 1904010-01A MSD				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q				SeqNo: 5596561		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	247.2	20	250	-6.48	101	81-119	264.9	6.91	20	

The following samples were analyzed in this batch:

19031664-04A	19031664-05A	19031664-06A
--------------	--------------	--------------

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

14031664

Chain of Custody



Workorder: 10468460

Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Results Requested By: 4/17/2019

Report / Invoice To		Subcontract To				Requested Analysis													LAB USE ONLY	
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436 Email: jennifer.anderson@pacelabs.com		ALS 3352 128th Avenue Holland, MI 49424				P.O. 10468460														
State of Sample Origin: MN						Free Cyanide														
Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Other BP 3A															
1	813766	3/27/2019 10:40	10468460001	Water	1															X
2	813741	3/27/2019 11:40	10468460002	Water	1															X
3	M-1	3/27/2019 11:42	10468460003	Water	1															X
4	813768	3/27/2019 12:40	10468460004	Water	1															X
5	813767	3/27/2019 13:40	10468460005	Water	1															X
6	813765	3/27/2019 15:40	10468460006	Water	1															X
Comments																				
Transfers	Released By	Date/Time	Received By		Date/Time															
1		3/28/19 1440			3/29/19 0930															
2																				
3																				
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact														
22 °C		Y or N		Y or N		Y or N														
SR2																				

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **29-Mar-19 09:30**

Work Order: **19031664**

Received by: **DS**

Checklist completed by Diane Shaw 29-Mar-19
eSignature Date

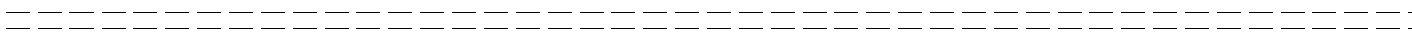
Reviewed by: Chad Whilton 31-Mar-19
eSignature Date

Matrices: Water

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>2.2/2.2 c</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>3/29/2019 11:18:49 AM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<u></u>		

Login Notes:



Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 16, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/29/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2019
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
813766	A191321-01	Water	03/27/2019	03/29/2019
813741	A191321-02	Water	03/27/2019	03/29/2019
M-1	A191321-03	Water	03/27/2019	03/29/2019
813768	A191321-04	Water	03/27/2019	03/29/2019
813767	A191321-05	Water	03/27/2019	03/29/2019
813765	A191321-06	Water	03/27/2019	03/29/2019

CASE NARRATIVE

Sample Receipt Information:

6 samples were received on 03/29/2019. Samples were received at 2.4 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

813766

A191321-01 (Water)

Date Sampled
03/27/2019 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
---------	--------	-----------------	-------	----------	----------	----------	--------	------------

Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:54	EPA 8270D	
Surrogate: Atrazine-d5		79.0 %		56.9-123	04/01/2019	04/03/2019 06:54	EPA 8270D	
Surrogate: Parathion-d10		109 %		23.8-169	04/01/2019	04/03/2019 06:54	EPA 8270D	
Surrogate: Triphenyl phosphate		110 %		50.5-178	04/01/2019	04/03/2019 06:54	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:48	EPA 8151A	
Surrogate: 2,4-D-d5		82.4 %		44.2-121	04/03/2019	04/07/2019 01:48	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

813741

Date Sampled

A191321-02 (Water)

03/27/2019 11:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 04:34	EPA 8270D	
Surrogate: Atrazine-d5		85.3 %		56.9-123	04/01/2019	04/03/2019 04:34	EPA 8270D	
Surrogate: Parathion-d10		94.6 %		23.8-169	04/01/2019	04/03/2019 04:34	EPA 8270D	
Surrogate: Triphenyl phosphate		101 %		50.5-178	04/01/2019	04/03/2019 04:34	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:24	EPA 8151A	
Surrogate: 2,4-D-d5		83.3 %		44.2-121	04/03/2019	04/07/2019 01:24	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

M-1
A191321-03 (Water)

Date Sampled
03/27/2019 11:42

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:02	EPA 8270D	
Surrogate: Atrazine-d5		108 %	56.9-123		04/01/2019	04/03/2019 05:02	EPA 8270D	
Surrogate: Parathion-d10		100 %	23.8-169		04/01/2019	04/03/2019 05:02	EPA 8270D	
Surrogate: Triphenyl phosphate		151 %	50.5-178		04/01/2019	04/03/2019 05:02	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 01:59	EPA 8151A	
Surrogate: 2,4-D-d5		80.3 %	44.2-121		04/03/2019	04/07/2019 01:59	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

813768

Date Sampled

A191321-04 (Water)

03/27/2019 12:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:30	EPA 8270D	
Surrogate: Atrazine-d5		90.0 %		56.9-123	04/01/2019	04/03/2019 05:30	EPA 8270D	
Surrogate: Parathion-d10		110 %		23.8-169	04/01/2019	04/03/2019 05:30	EPA 8270D	
Surrogate: Triphenyl phosphate		117 %		50.5-178	04/01/2019	04/03/2019 05:30	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:21	EPA 8151A	
Surrogate: 2,4-D-d5		92.3 %		44.2-121	04/03/2019	04/07/2019 05:21	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

813767

Date Sampled

A191321-05 (Water)

03/27/2019 13:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 05:58	EPA 8270D	
Surrogate: Atrazine-d5		92.6 %		56.9-123	04/01/2019	04/03/2019 05:58	EPA 8270D	
Surrogate: Parathion-d10		107 %		23.8-169	04/01/2019	04/03/2019 05:58	EPA 8270D	
Surrogate: Triphenyl phosphate		154 %		50.5-178	04/01/2019	04/03/2019 05:58	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 05:57	EPA 8151A	
Surrogate: 2,4-D-d5		87.7 %		44.2-121	04/03/2019	04/07/2019 05:57	EPA 8151A	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

813765

Date Sampled

A191321-06 (Water)

03/27/2019 15:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904126

Acetochlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/01/2019	04/03/2019 06:26	EPA 8270D	
Surrogate: Atrazine-d5		88.7 %		56.9-123	04/01/2019	04/03/2019 06:26	EPA 8270D	
Surrogate: Parathion-d10		174 %		23.8-169	04/01/2019	04/03/2019 06:26	EPA 8270D	S
Surrogate: Triphenyl phosphate		162 %		50.5-178	04/01/2019	04/03/2019 06:26	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 06:32	EPA 8151A	
Surrogate: 2,4-D-d5		168 %		44.2-121	04/03/2019	04/07/2019 06:32	EPA 8151A	S

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904126 - EPA 3510C

Blank (A904126-BLK1)

Prepared: 04/01/2019 Analyzed: 04/02/2019 22:29

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							

Surrogate: Atrazine-d5 0.431 ug/L 0.5000 86.2 56.9-123

Surrogate: Parathion-d10 0.432 ug/L 0.5000 86.3 23.8-169

Surrogate: Triphenyl phosphate 0.424 ug/L 0.5000 84.9 50.5-178

LCS (A904126-BS1)

Prepared: 04/01/2019 Analyzed: 04/03/2019 02:42

Acetochlor	0.818	0.50	ug/L	1.000		81.8	67.8-122
Alachlor	0.845	0.50	ug/L	1.000		84.5	68.6-119
Atrazine	0.827	0.50	ug/L	1.000		82.7	68.6-115
Chlorpyrifos	0.833	0.50	ug/L	1.000		83.3	63.1-120
Cyanazine	0.892	0.20	ug/L	1.000		89.2	55.3-143
Desethylatrazine	0.827	0.50	ug/L	1.000		82.7	67.8-115
Deisopropylatrazine	0.669	0.50	ug/L	1.000		66.9	50.1-100
Dimethenamid	0.845	0.50	ug/L	1.000		84.5	70.3-121
EPTC	0.673	0.50	ug/L	1.000		67.3	50.4-101
Ethalfuralin	0.846	0.50	ug/L	1.000		84.6	42.6-121
Fonofos	0.981	0.50	ug/L	1.000		98.1	56.6-119
Metolachlor	0.851	0.50	ug/L	1.000		85.1	71.3-128
Metribuzin	0.826	0.50	ug/L	1.000		82.6	64.9-120
Pendimethalin	0.774	0.50	ug/L	1.000		77.4	60.9-128
Phorate	0.674	0.30	ug/L	1.000		67.4	37.3-112
Prometon	0.836	0.50	ug/L	1.000		83.6	67.1-120
Propachlor	0.999	0.50	ug/L	1.000		99.9	66.2-127
Propazine	0.928	0.50	ug/L	1.000		92.8	68.2-118
Simazine	0.848	0.50	ug/L	1.000		84.8	67.2-117

Pace Analytical
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Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904126 - EPA 3510C

LCS (A904126-BS1)

Prepared: 04/01/2019 Analyzed: 04/03/2019 02:42

Terbufos	0.637	0.20	ug/L	1.000		63.7	34.3-111			
Triallate	1.01	0.50	ug/L	1.000		101	53-121			
Trifluralin	0.675	0.50	ug/L	1.000		67.5	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.443</i>		<i>ug/L</i>	<i>0.5000</i>		<i>88.6</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.534</i>		<i>ug/L</i>	<i>0.5000</i>		<i>107</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.478</i>		<i>ug/L</i>	<i>0.5000</i>		<i>95.6</i>	<i>50.5-178</i>			

Matrix Spike (A904126-MS1)

Source: A191315-01

Prepared: 04/01/2019 Analyzed: 04/03/2019 01:45

Acetochlor	0.812	0.50	ug/L	1.000	ND	81.2	66.8-131			
Alachlor	0.816	0.50	ug/L	1.000	ND	81.6	68.2-133			
Atrazine	0.829	0.50	ug/L	1.000	ND	82.9	70-119			
Chlorpyrifos	0.846	0.50	ug/L	1.000	ND	84.6	64.9-131			
Cyanazine	0.878	0.20	ug/L	1.000	ND	87.8	62.6-155			
Desethylatrazine	0.841	0.50	ug/L	1.000	ND	84.1	63.2-129			
Deisopropylatrazine	0.613	0.50	ug/L	1.000	ND	61.3	43-119			
Dimethenamid	0.816	0.50	ug/L	1.000	ND	81.6	71-132			
EPTC	0.644	0.50	ug/L	1.000	ND	64.4	50-110			
Ethalfuralin	0.719	0.50	ug/L	1.000	ND	71.9	42.9-140			
Fonofos	0.772	0.50	ug/L	1.000	ND	77.2	52.1-124			
Metolachlor	0.846	0.50	ug/L	1.000	ND	84.6	50.8-155			
Metribuzin	0.812	0.50	ug/L	1.000	ND	81.2	66.7-131			
Pendimethalin	0.787	0.50	ug/L	1.000	ND	78.7	61.2-152			
Phorate	0.704	0.30	ug/L	1.000	ND	70.4	42-122			
Prometon	0.811	0.50	ug/L	1.000	ND	81.1	64.1-135			
Propachlor	0.774	0.50	ug/L	1.000	ND	77.4	61.4-137			
Propazine	0.891	0.50	ug/L	1.000	ND	89.1	68.2-126			
Simazine	0.789	0.50	ug/L	1.000	ND	78.9	68.4-122			
Terbufos	0.720	0.20	ug/L	1.000	ND	72.0	43.5-119			
Triallate	0.781	0.50	ug/L	1.000	ND	78.1	58.4-122			
Trifluralin	0.682	0.50	ug/L	1.000	ND	68.2	51-132			
<i>Surrogate: Atrazine-d5</i>	<i>0.409</i>		<i>ug/L</i>	<i>0.5000</i>		<i>81.8</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.408</i>		<i>ug/L</i>	<i>0.5000</i>		<i>81.7</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.484</i>		<i>ug/L</i>	<i>0.5000</i>		<i>96.7</i>	<i>50.5-178</i>			

Matrix Spike Dup (A904126-MSD1)

Source: A191315-01

Prepared: 04/01/2019 Analyzed: 04/03/2019 02:13

Acetochlor	0.774	0.50	ug/L	1.010	ND	76.6	66.8-131	4.77	20	
Alachlor	0.799	0.50	ug/L	1.010	ND	79.1	68.2-133	2.19	20	
Atrazine	0.788	0.50	ug/L	1.010	ND	78.0	70-119	5.04	20	
Chlorpyrifos	0.821	0.50	ug/L	1.010	ND	81.3	64.9-131	3.00	20	
Cyanazine	0.917	0.20	ug/L	1.010	ND	90.7	62.6-155	4.34	20	
Desethylatrazine	0.845	0.50	ug/L	1.010	ND	83.7	63.2-129	0.445	20	
Deisopropylatrazine	0.692	0.50	ug/L	1.010	ND	68.5	43-119	12.1	20	
Dimethenamid	0.800	0.50	ug/L	1.010	ND	79.2	71-132	1.95	20	
EPTC	0.692	0.50	ug/L	1.010	ND	68.5	50-110	7.24	20	
Ethalfuralin	0.831	0.50	ug/L	1.010	ND	82.3	42.9-140	14.4	20	
Fonofos	0.862	0.50	ug/L	1.010	ND	85.3	52.1-124	11.0	20	

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Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904126 - EPA 3510C

Matrix Spike Dup (A904126-MSD1)

Source: A191315-01

Prepared: 04/01/2019 Analyzed: 04/03/2019 02:13

Metolachlor	0.840	0.50	ug/L	1.010	ND	83.2	50.8-155	0.688	20	
Metribuzin	0.814	0.50	ug/L	1.010	ND	80.6	66.7-131	0.368	20	
Pendimethalin	0.778	0.50	ug/L	1.010	ND	77.1	61.2-152	1.10	20	
Phorate	0.689	0.30	ug/L	1.010	ND	68.2	42-122	2.09	20	
Prometon	0.799	0.50	ug/L	1.010	ND	79.1	64.1-135	1.52	20	
Propachlor	0.926	0.50	ug/L	1.010	ND	91.7	61.4-137	17.9	20	
Propazine	0.882	0.50	ug/L	1.010	ND	87.4	68.2-126	1.02	20	
Simazine	0.832	0.50	ug/L	1.010	ND	82.4	68.4-122	5.30	20	
Terbufos	0.659	0.20	ug/L	1.010	ND	65.2	43.5-119	8.81	20	
Triallate	0.856	0.50	ug/L	1.010	ND	84.8	58.4-122	9.17	20	
Trifluralin	0.737	0.50	ug/L	1.010	ND	72.9	51-132	7.66	20	
Surrogate: Atrazine-d5	0.425		ug/L	0.5051		84.1	56.9-123			
Surrogate: Parathion-d10	0.479		ug/L	0.5051		94.8	23.8-169			
Surrogate: Triphenyl phosphate	0.487		ug/L	0.5051		96.4	50.5-178			

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Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904142 - EPA 3510C

Blank (A904142-BLK1)

Prepared: 04/03/2019 Analyzed: 04/06/2019 23:26

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
Surrogate: 2,4-D-d5	1.51		ug/L	2.006		75.1	44.2-121			

LCS (A904142-BS1)

Prepared: 04/03/2019 Analyzed: 04/07/2019 00:01

2,4-D	1.90	0.50	ug/L	2.000		95.1	64.6-148			
2,4-DB	1.80	0.50	ug/L	2.000		89.9	66.7-143			
2,4,5-T	1.80	0.50	ug/L	2.000		90.1	63.4-133			
2,4,5-TP (Silvex)	1.68	0.50	ug/L	2.000		84.1	63-145			
Bentazon	0.679	0.50	ug/L	1.000		67.9	52.5-139			
Dicamba	1.61	0.50	ug/L	2.000		80.6	55.4-143			
MCPA	1.45	0.30	ug/L	2.000		72.4	33.5-143			
Picloram	0.740	0.50	ug/L	1.000		74.0	47.9-113			
Triclopyr	1.62	0.50	ug/L	2.000		80.9	65.1-141			
Surrogate: 2,4-D-d5	1.60		ug/L	2.006		79.6	44.2-121			

LCS Dup (A904142-BSD1)

Prepared: 04/03/2019 Analyzed: 04/07/2019 00:37

2,4-D	1.73	0.50	ug/L	2.000		86.4	64.6-148	9.56	20	
2,4-DB	1.63	0.50	ug/L	2.000		81.6	66.7-143	9.67	20	
2,4,5-T	1.67	0.50	ug/L	2.000		83.5	63.4-133	7.57	20	
2,4,5-TP (Silvex)	1.59	0.50	ug/L	2.000		79.3	63-145	5.92	20	
Bentazon	0.656	0.50	ug/L	1.000		65.6	52.5-139	3.52	20	
Dicamba	1.64	0.50	ug/L	2.000		81.8	55.4-143	1.47	20	
MCPA	1.45	0.30	ug/L	2.000		72.4	33.5-143	0.0138	20	
Picloram	0.714	0.50	ug/L	1.000		71.4	47.9-113	3.60	20	
Triclopyr	1.56	0.50	ug/L	2.000		77.9	65.1-141	3.79	20	
Surrogate: 2,4-D-d5	1.47		ug/L	2.006		73.2	44.2-121			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468460
Project Manager: Jennifer Anderson

Notes and Definitions

- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

A191321

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No



Workorder: 10468460 Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Owner Received Date: 3/27/2019 Results Requested By: 4/17/2019

Report To	Subcontract To	Requested Analysis																					
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436	Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																						

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers										LAB USE ONLY							
						Unpreserved	AGIU																
1	813766	PS	3/27/2019 10:40	10468460001	Water	4																	61
2	813741	PS	3/27/2019 11:40	10468460002	Water	4																	02
3	M-1	PS	3/27/2019 11:42	10468460003	Water	4																	03
4	813768	PS	3/27/2019 12:40	10468460004	Water	4																	04
5	813767	PS	3/27/2019 13:40	10468460005	Water	4																	05
6	813765	PS	3/27/2019 15:40	10468460006	Water	4																	06

Transfers					Comments		
Released By	Date/Time	Received By	Date/Time				
<i>[Signature]</i>	3/28/19 12:50	<i>[Signature]</i>	3/29/19 11:06	1	Need MPCA Equis EDD and Barr Equis 5 EDD		
				2			
	2.4°C			3			

Cooler Temperature on Receipt 2.2°C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp 7/13/19

April 18, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468606

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 28, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468606

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683

Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10468606001	462520	Water	03/28/19 11:25	03/28/19 14:55
10468606002	240818	Water	03/28/19 11:00	03/28/19 14:55
10468606003	462523	Water	03/28/19 12:30	03/28/19 14:55
10468606004	434011	Water	03/28/19 14:20	03/28/19 14:55

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10468606001	462520	EPA 8082A	RAG	11	PASI-M		
		EPA 200.7	IP	9	PASI-M		
		EPA 200.8	RJS	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	NEG	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10468606002	240818	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	IP	9	PASI-M
EPA 200.8	RJS			12	PASI-M		
EPA 8270D	STB			38	PASI-M		
	CLJ			16	PASI-V		
EPA 900.0	NEG			2	PASI-PA		
EPA 300.0	KEO			1	PASI-M		
SM 3500-Cr B Modified	JFP			1	PASI-M		
EPA 350.1	CLJ			1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V		
SM 4500-CN-E	DCL			1	PASI-M		
10468606003	462523			EPA 8082A	RAG	11	PASI-M
				EPA 200.7	IP	9	PASI-M
		EPA 200.8	RJS	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	NEG	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10468606004	434011	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	IP	9	PASI-M
EPA 200.8	RJS			12	PASI-M		
EPA 8270D	STB			38	PASI-M		

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
			CLJ	16	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 462520	Lab ID: 10468606001	Collected: 03/28/19 11:25	Received: 03/28/19 14:55	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	03/28/19 16:19	04/01/19 14:48	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	55	%	30-125	1	03/28/19 16:19	04/01/19 14:48	877-09-8	
Decachlorobiphenyl (S)	69	%	30-125	1	03/28/19 16:19	04/01/19 14:48	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/29/19 11:33	04/01/19 15:09	7429-90-5	
Barium, Dissolved	206	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:09	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:09	7440-50-8	
Manganese, Dissolved	51.8	ug/L	5.0	1	03/29/19 11:33	04/01/19 15:09	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/19 11:33	04/01/19 15:09	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:09	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/29/19 11:33	04/01/19 15:09	7440-31-5	
Total Hardness by 2340B, Dissolved	258000	ug/L	3300	1	03/29/19 11:33	04/01/19 15:09		
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/19 11:33	04/01/19 15:09	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:33	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:33	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/29/19 11:53	04/17/19 00:33	7440-41-7	
Boron, Dissolved	35.4	ug/L	10.0	1	03/29/19 11:53	04/17/19 00:33	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/29/19 11:53	04/17/19 00:33	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:33	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:33	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/29/19 11:53	04/17/19 00:33	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:33	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/29/19 11:53	04/17/19 00:33	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:33	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/29/19 11:53	04/17/19 00:33	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	83-32-9	
Anthracene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	50-32-8	
Benzoic acid	ND	ug/L	47.4	1	03/28/19 16:02	04/02/19 16:45	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 462520 **Lab ID: 10468606001** Collected: 03/28/19 11:25 Received: 03/28/19 14:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	47.4	1	03/28/19 16:02	04/02/19 16:45	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	120-83-2	
Diethylphthalate	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	105-67-9	
Dimethylphthalate	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	117-81-7	
Fluoranthene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	206-44-0	
Fluorene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	86-73-7	
Hexachlorobenzene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	47.4	1	03/28/19 16:02	04/02/19 16:45	77-47-4	
Hexachloroethane	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	67-72-1	
Isophorone	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.0	1	03/28/19 16:02	04/02/19 16:45		
N-Nitrosodimethylamine	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	62-75-9	
Pentachlorophenol	ND	ug/L	19.0	1	03/28/19 16:02	04/02/19 16:45	87-86-5	
Phenanthrene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	85-01-8	
Phenol	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	108-95-2	
Pyrene	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.5	1	03/28/19 16:02	04/02/19 16:45	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	81	%.	55-125	1	03/28/19 16:02	04/02/19 16:45	4165-60-0	
2-Fluorobiphenyl (S)	77	%.	52-125	1	03/28/19 16:02	04/02/19 16:45	321-60-8	
p-Terphenyl-d14 (S)	89	%.	57-125	1	03/28/19 16:02	04/02/19 16:45	1718-51-0	
Phenol-d6 (S)	75	%.	30-125	1	03/28/19 16:02	04/02/19 16:45	13127-88-3	
2-Fluorophenol (S)	73	%.	30-125	1	03/28/19 16:02	04/02/19 16:45	367-12-4	
2,4,6-Tribromophenol (S)	92	%.	52-125	1	03/28/19 16:02	04/02/19 16:45	118-79-6	

Field Data

Analytical Method:

Well Locked	Yes			1		03/28/19 11:25		
Purge Method	Grundfos Redi-Flo			1		03/28/19 11:25		
Total Well Depth	207.0	feet		1		03/28/19 11:25		
Depth of Water	42.49			1		03/28/19 11:25		
Well Volume Purged	325.5			1		03/28/19 11:25		
Purge Rate	3.5			1		03/28/19 11:25		
Collected Date	03/28/19			1		03/28/19 11:25		
Collected Time	1125			1		03/28/19 11:25		
Field pH	7.5	Std. Units		1		03/28/19 11:25		
Field Temperature	10.5	deg C		1		03/28/19 11:25		
Field Specific Conductance	230	umhos/cm		1		03/28/19 11:25		
Oxygen, Dissolved	0.5	mg/L		1		03/28/19 11:25	7782-44-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 462520		Lab ID: 10468606001		Collected: 03/28/19 11:25	Received: 03/28/19 14:55	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
REDOX	-94	mV		1		03/28/19 11:25		
Turbidity	6.0	NTU		1		03/28/19 11:25		
Apparent Color	Clear			1		03/28/19 11:25		
Odor	No			1		03/28/19 11:25		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	ND	mg/L	1.2	1		04/02/19 07:24	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/28/19 16:56		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/05/19 09:15		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	0.21	mg/L	0.11	1	04/02/19 10:00	04/03/19 10:46	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 09:25	57-12-5	

Sample: 240818		Lab ID: 10468606002		Collected: 03/28/19 11:00	Received: 03/28/19 14:55	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.095	1	03/28/19 16:19	04/01/19 15:03	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	50	%	30-125	1	03/28/19 16:19	04/01/19 15:03	877-09-8	
Decachlorobiphenyl (S)	65	%	30-125	1	03/28/19 16:19	04/01/19 15:03	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/29/19 11:33	04/01/19 15:14	7429-90-5	
Barium, Dissolved	204	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:14	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:14	7440-50-8	
Manganese, Dissolved	1530	ug/L	5.0	1	03/29/19 11:33	04/01/19 15:14	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/19 11:33	04/01/19 15:14	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:14	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 240818	Lab ID: 10468606002	Collected: 03/28/19 11:00	Received: 03/28/19 14:55	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	03/29/19 11:33	04/01/19 15:14	7440-31-5	
Total Hardness by 2340B, Dissolved	790000	ug/L	3300	1	03/29/19 11:33	04/01/19 15:14		
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/19 11:33	04/01/19 15:14	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	0.50	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:46	7440-36-0	
Arsenic, Dissolved	0.82	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:46	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/29/19 11:53	04/17/19 00:46	7440-41-7	
Boron, Dissolved	42.0	ug/L	10.0	1	03/29/19 11:53	04/17/19 13:27	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/29/19 11:53	04/17/19 00:46	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:46	7440-47-3	
Cobalt, Dissolved	1.6	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:46	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/29/19 11:53	04/17/19 00:46	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:46	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	03/29/19 11:53	04/17/19 00:46	7440-28-0	
Uranium-238, Dissolved	4.4	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:46	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/29/19 11:53	04/17/19 00:46	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	83-32-9	
Anthracene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	50-32-8	
Benzoic acid	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 17:10	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	111-44-4	
2-Chlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 17:10	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	206-44-0	
Fluorene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.0	1	03/28/19 16:02	04/02/19 17:10	77-47-4	
Hexachloroethane	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	67-72-1	
Isophorone	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.6	1	03/28/19 16:02	04/02/19 17:10		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 240818	Lab ID: 10468606002	Collected: 03/28/19 11:00	Received: 03/28/19 14:55	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Pentachlorophenol	ND	ug/L	19.6	1	03/28/19 16:02	04/02/19 17:10	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	85-01-8	
Phenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	108-95-2	
Pyrene	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	03/28/19 16:02	04/02/19 17:10	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	73	%	55-125	1	03/28/19 16:02	04/02/19 17:10	4165-60-0	
2-Fluorobiphenyl (S)	72	%	52-125	1	03/28/19 16:02	04/02/19 17:10	321-60-8	
p-Terphenyl-d14 (S)	79	%	57-125	1	03/28/19 16:02	04/02/19 17:10	1718-51-0	
Phenol-d6 (S)	68	%	30-125	1	03/28/19 16:02	04/02/19 17:10	13127-88-3	
2-Fluorophenol (S)	67	%	30-125	1	03/28/19 16:02	04/02/19 17:10	367-12-4	
2,4,6-Tribromophenol (S)	91	%	52-125	1	03/28/19 16:02	04/02/19 17:10	118-79-6	
Field Data		Analytical Method:						
Well Locked	No			1		03/28/19 11:00		
Purge Method	Peristaltic pump			1		03/28/19 11:00		
Total Well Depth	16.79	feet		1		03/28/19 11:00		
Depth of Water	8.93			1		03/28/19 11:00		
Well Volume Purged	4.2			1		03/28/19 11:00		
Purge Rate	0.2			1		03/28/19 11:00		
Collected Date	03/28/19			1		03/28/19 11:00		
Collected Time	1100			1		03/28/19 11:00		
Field pH	6.2	Std. Units		1		03/28/19 11:00		
Field Temperature	6.0	deg C		1		03/28/19 11:00		
Field Specific Conductance	1570	umhos/cm		1		03/28/19 11:00		
Oxygen, Dissolved	0.7	mg/L		1		03/28/19 11:00	7782-44-7	
REDOX	-6	mV		1		03/28/19 11:00		
Turbidity	7.3	NTU		1		03/28/19 11:00		
Apparent Color	Clear			1		03/28/19 11:00		
Odor	No			1		03/28/19 11:00		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	12.7	mg/L	1.2	1		04/02/19 07:54	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	0.14	mg/L	0.010	1		03/28/19 16:56		FS
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/05/19 09:15		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	0.47	mg/L	0.11	1	04/02/19 10:00	04/03/19 10:47	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 09:29	57-12-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 462523	Lab ID: 10468606003	Collected: 03/28/19 12:30	Received: 03/28/19 14:55	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.096	1	03/28/19 16:19	04/01/19 15:19	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	64	%	30-125	1	03/28/19 16:19	04/01/19 15:19	877-09-8	
Decachlorobiphenyl (S)	35	%	30-125	1	03/28/19 16:19	04/01/19 15:19	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	03/29/19 11:33	04/01/19 15:16	7429-90-5	
Barium, Dissolved	278	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:16	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:16	7440-50-8	
Manganese, Dissolved	994	ug/L	5.0	1	03/29/19 11:33	04/01/19 15:16	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/19 11:33	04/01/19 15:16	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:16	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	03/29/19 11:33	04/01/19 15:16	7440-31-5	
Total Hardness by 2340B, Dissolved	518000	ug/L	3300	1	03/29/19 11:33	04/01/19 15:16		
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/19 11:33	04/01/19 15:16	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:37	7440-36-0	
Arsenic, Dissolved	4.2	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:37	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/29/19 11:53	04/17/19 00:37	7440-41-7	
Boron, Dissolved	671	ug/L	10.0	1	03/29/19 11:53	04/17/19 00:37	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/29/19 11:53	04/17/19 00:37	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:37	7440-47-3	
Cobalt, Dissolved	6.4	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:37	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/29/19 11:53	04/17/19 00:37	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:37	7782-49-2	
Thallium, Dissolved	0.77	ug/L	0.10	1	03/29/19 11:53	04/17/19 00:37	7440-28-0	
Uranium-238, Dissolved	0.52	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:37	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/29/19 11:53	04/17/19 00:37	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	83-32-9	
Anthracene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	50-32-8	
Benzoic acid	ND	ug/L	49.3	1	03/28/19 16:02	04/02/19 17:34	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 462523 Lab ID: 10468606003 Collected: 03/28/19 12:30 Received: 03/28/19 14:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.3	1	03/28/19 16:02	04/02/19 17:34	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	120-83-2	
Diethylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	105-67-9	
Dimethylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	117-81-7	
Fluoranthene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	206-44-0	
Fluorene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	86-73-7	
Hexachlorobenzene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.3	1	03/28/19 16:02	04/02/19 17:34	77-47-4	
Hexachloroethane	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	67-72-1	
Isophorone	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.7	1	03/28/19 16:02	04/02/19 17:34		
N-Nitrosodimethylamine	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	62-75-9	
Pentachlorophenol	ND	ug/L	19.7	1	03/28/19 16:02	04/02/19 17:34	87-86-5	
Phenanthrene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	85-01-8	
Phenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	108-95-2	
Pyrene	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.9	1	03/28/19 16:02	04/02/19 17:34	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	74	%.	55-125	1	03/28/19 16:02	04/02/19 17:34	4165-60-0	
2-Fluorobiphenyl (S)	76	%.	52-125	1	03/28/19 16:02	04/02/19 17:34	321-60-8	
p-Terphenyl-d14 (S)	83	%.	57-125	1	03/28/19 16:02	04/02/19 17:34	1718-51-0	
Phenol-d6 (S)	74	%.	30-125	1	03/28/19 16:02	04/02/19 17:34	13127-88-3	
2-Fluorophenol (S)	70	%.	30-125	1	03/28/19 16:02	04/02/19 17:34	367-12-4	
2,4,6-Tribromophenol (S)	97	%.	52-125	1	03/28/19 16:02	04/02/19 17:34	118-79-6	

Field Data

Analytical Method:

Collected Date	03/28/19			1		03/28/19 12:30		
Collected Time	1230			1		03/28/19 12:30		
Field pH	7.0	Std. Units		1		03/28/19 12:30		
Field Temperature	11.5	deg C		1		03/28/19 12:30		
Field Specific Conductance	1370	umhos/cm		1		03/28/19 12:30		
Oxygen, Dissolved	0.2	mg/L		1		03/28/19 12:30	7782-44-7	
REDOX	-82	mV		1		03/28/19 12:30		
Turbidity	5.2	NTU		1		03/28/19 12:30		
Apparent Color	Clear			1		03/28/19 12:30		
Odor	No			1		03/28/19 12:30		
Well Locked	Yes			1		03/28/19 12:30		
Purge Method	Grundfos Redi-Flo			1		03/28/19 12:30		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Project No.: 10468606

Sample: 462523		Lab ID: 10468606003		Collected: 03/28/19 12:30	Received: 03/28/19 14:55	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Total Well Depth	86.17	feet		1		03/28/19 12:30		
Depth of Water	55.52			1		03/28/19 12:30		
Well Volume Purged	60.0			1		03/28/19 12:30		
Purge Rate	2.0			1		03/28/19 12:30		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	137	mg/L	2.4	2		04/02/19 12:18	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/28/19 16:56		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	0.013	mg/L	0.010	1		04/05/19 09:16		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	6.3	mg/L	0.22	2	04/02/19 10:00	04/03/19 10:48	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 09:30	57-12-5	

Sample: 434011		Lab ID: 10468606004		Collected: 03/28/19 14:20	Received: 03/28/19 14:55	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/28/19 16:19	04/01/19 15:34	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	66	%	30-125	1	03/28/19 16:19	04/01/19 15:34	877-09-8	
Decachlorobiphenyl (S)	35	%	30-125	1	03/28/19 16:19	04/01/19 15:34	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	03/29/19 11:33	04/01/19 15:17	7429-90-5	
Barium, Dissolved	559	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:17	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:17	7440-50-8	
Manganese, Dissolved	390	ug/L	5.0	1	03/29/19 11:33	04/01/19 15:17	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	03/29/19 11:33	04/01/19 15:17	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	03/29/19 11:33	04/01/19 15:17	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 434011	Lab ID: 10468606004	Collected: 03/28/19 14:20	Received: 03/28/19 14:55	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	03/29/19 11:33	04/01/19 15:17	7440-31-5	
Total Hardness by 2340B, Dissolved	524000	ug/L	3300	1	03/29/19 11:33	04/01/19 15:17		
Zinc, Dissolved	ND	ug/L	20.0	1	03/29/19 11:33	04/01/19 15:17	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:42	7440-36-0	
Arsenic, Dissolved	4.7	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:42	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/29/19 11:53	04/17/19 00:42	7440-41-7	
Boron, Dissolved	386	ug/L	10.0	1	03/29/19 11:53	04/17/19 00:42	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/29/19 11:53	04/17/19 00:42	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:42	7440-47-3	
Cobalt, Dissolved	6.0	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:42	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	03/29/19 11:53	04/17/19 00:42	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:42	7782-49-2	
Thallium, Dissolved	0.20	ug/L	0.10	1	03/29/19 11:53	04/17/19 00:42	7440-28-0	
Uranium-238, Dissolved	0.99	ug/L	0.50	1	03/29/19 11:53	04/17/19 00:42	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	03/29/19 11:53	04/17/19 00:42	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	83-32-9	
Anthracene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	50-32-8	
Benzoic acid	ND	ug/L	50.5	1	03/28/19 16:02	04/02/19 17:58	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	111-44-4	
2-Chlorophenol	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	50.5	1	03/28/19 16:02	04/02/19 17:58	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	120-83-2	
Diethylphthalate	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	105-67-9	
Dimethylphthalate	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	117-81-7	
Fluoranthene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	206-44-0	
Fluorene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	86-73-7	
Hexachlorobenzene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	50.5	1	03/28/19 16:02	04/02/19 17:58	77-47-4	
Hexachloroethane	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	67-72-1	
Isophorone	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	20.2	1	03/28/19 16:02	04/02/19 17:58		
N-Nitrosodimethylamine	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Sample: 434011	Lab ID: 10468606004	Collected: 03/28/19 14:20	Received: 03/28/19 14:55	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Pentachlorophenol	ND	ug/L	20.2	1	03/28/19 16:02	04/02/19 17:58	87-86-5	
Phenanthrene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	85-01-8	
Phenol	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	108-95-2	
Pyrene	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.1	1	03/28/19 16:02	04/02/19 17:58	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	82	%	55-125	1	03/28/19 16:02	04/02/19 17:58	4165-60-0	
2-Fluorobiphenyl (S)	81	%	52-125	1	03/28/19 16:02	04/02/19 17:58	321-60-8	
p-Terphenyl-d14 (S)	86	%	57-125	1	03/28/19 16:02	04/02/19 17:58	1718-51-0	
Phenol-d6 (S)	80	%	30-125	1	03/28/19 16:02	04/02/19 17:58	13127-88-3	
2-Fluorophenol (S)	77	%	30-125	1	03/28/19 16:02	04/02/19 17:58	367-12-4	
2,4,6-Tribromophenol (S)	98	%	52-125	1	03/28/19 16:02	04/02/19 17:58	118-79-6	
Field Data								
Analytical Method:								
Well Locked	Yes			1		03/28/19 14:20		
Purge Method	Grundfos Redi-Flo			1		03/28/19 14:20		
Total Well Depth	102.00	feet		1		03/28/19 14:20		
Depth of Water	67.35			1		03/28/19 14:20		
Well Volume Purged	72.0			1		03/28/19 14:20		
Purge Rate	1.5			1		03/28/19 14:20		
Collected Date	03/28/19			1		03/28/19 14:20		
Collected Time	1420			1		03/28/19 14:20		
Field pH	7.0	Std. Units		1		03/28/19 14:20		
Field Temperature	12.5	deg C		1		03/28/19 14:20		
Field Specific Conductance	1370	umhos/cm		1		03/28/19 14:20		
Oxygen, Dissolved	0.2	mg/L		1		03/28/19 14:20	7782-44-7	
REDOX	-94	mV		1		03/28/19 14:20		
Turbidity	10.5	NTU		1		03/28/19 14:20		
Apparent Color	Clear			1		03/28/19 14:20		
Odor	No			1		03/28/19 14:20		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	132	mg/L	2.4	2		04/02/19 12:37	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/28/19 16:56		FS
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.018	mg/L	0.010	1		04/05/19 09:17		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	7.9	mg/L	0.11	1	04/02/19 10:00	04/03/19 10:52	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 09:33	57-12-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468606

QC Batch: 596392 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 3224427 Matrix: Water
Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/01/19 14:57	
Barium, Dissolved	ug/L	ND	10.0	04/01/19 14:57	
Copper, Dissolved	ug/L	ND	10.0	04/01/19 14:57	
Manganese, Dissolved	ug/L	ND	5.0	04/01/19 14:57	
Nickel, Dissolved	ug/L	ND	20.0	04/01/19 14:57	
Silver, Dissolved	ug/L	ND	10.0	04/01/19 14:57	
Tin, Dissolved	ug/L	ND	75.0	04/01/19 14:57	
Zinc, Dissolved	ug/L	ND	20.0	04/01/19 14:57	

LABORATORY CONTROL SAMPLE: 3224428

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20900	105	85-115	
Barium, Dissolved	ug/L	1000	1020	102	85-115	
Copper, Dissolved	ug/L	1000	958	96	85-115	
Manganese, Dissolved	ug/L	1000	1020	102	85-115	
Nickel, Dissolved	ug/L	1000	990	99	85-115	
Silver, Dissolved	ug/L	500	506	101	85-115	
Tin, Dissolved	ug/L	1000	1010	101	85-115	
Zinc, Dissolved	ug/L	1000	1000	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3224430 3224431

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10468606001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Aluminum, Dissolved	ug/L	ND	20000	20000	20900	21100	104	105	70-130	1	20	
Barium, Dissolved	ug/L	206	1000	1000	1200	1250	100	104	70-130	4	20	
Copper, Dissolved	ug/L	ND	1000	1000	968	979	97	98	70-130	1	20	
Manganese, Dissolved	ug/L	51.8	1000	1000	1050	1080	100	102	70-130	3	20	
Nickel, Dissolved	ug/L	ND	1000	1000	957	970	96	97	70-130	1	20	
Silver, Dissolved	ug/L	ND	500	500	510	515	102	103	70-130	1	20	
Tin, Dissolved	ug/L	ND	1000	1000	1010	1010	101	101	70-130	0	20	
Zinc, Dissolved	ug/L	ND	1000	1000	961	977	96	98	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

QC Batch: 596399 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
 Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 3224472 Matrix: Water
 Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/17/19 00:29	
Arsenic, Dissolved	ug/L	ND	0.50	04/17/19 00:29	
Beryllium, Dissolved	ug/L	ND	0.20	04/17/19 00:29	
Boron, Dissolved	ug/L	ND	10.0	04/17/19 00:29	
Cadmium, Dissolved	ug/L	ND	0.080	04/17/19 00:29	
Chromium, Dissolved	ug/L	ND	0.50	04/17/19 00:29	
Cobalt, Dissolved	ug/L	ND	0.50	04/17/19 00:29	
Lead, Dissolved	ug/L	ND	0.10	04/17/19 00:29	
Selenium, Dissolved	ug/L	ND	0.50	04/17/19 00:29	
Thallium, Dissolved	ug/L	ND	0.10	04/17/19 00:29	
Uranium-238, Dissolved	ug/L	ND	0.50	04/17/19 00:29	
Vanadium, Dissolved	ug/L	ND	1.0	04/17/19 00:29	

LABORATORY CONTROL SAMPLE: 3224473

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	100	100	85-115	
Arsenic, Dissolved	ug/L	100	98.8	99	85-115	
Beryllium, Dissolved	ug/L	100	101	101	85-115	
Boron, Dissolved	ug/L	100	103	103	85-115	
Cadmium, Dissolved	ug/L	100	101	101	85-115	
Chromium, Dissolved	ug/L	100	101	101	85-115	
Cobalt, Dissolved	ug/L	100	99.6	100	85-115	
Lead, Dissolved	ug/L	100	99.3	99	85-115	
Selenium, Dissolved	ug/L	100	100	100	85-115	
Thallium, Dissolved	ug/L	100	95.8	96	85-115	
Uranium-238, Dissolved	ug/L	100	100	100	85-115	
Vanadium, Dissolved	ug/L	100	98.9	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3224474 3224475

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10468606002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony, Dissolved	ug/L	0.50	100	100	101	103	100	102	70-130	2	20	
Arsenic, Dissolved	ug/L	0.82	100	100	101	104	101	103	70-130	3	20	
Beryllium, Dissolved	ug/L	ND	100	100	92.1	101	92	101	70-130	10	20	
Boron, Dissolved	ug/L	42.0	100	100	119	131	77	89	70-130	9	20	
Cadmium, Dissolved	ug/L	ND	100	100	97.2	98.1	97	98	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Parameter	Units	3224474		3224475		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10468606002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						MSD Result
Chromium, Dissolved	ug/L	ND	100	100	102	103	102	103	70-130	1	20
Cobalt, Dissolved	ug/L	1.6	100	100	104	106	103	104	70-130	2	20
Lead, Dissolved	ug/L	ND	100	100	94.1	96.2	94	96	70-130	2	20
Selenium, Dissolved	ug/L	ND	100	100	96.7	98.6	97	99	70-130	2	20
Thallium, Dissolved	ug/L	ND	100	100	93.5	95.7	94	96	70-130	2	20
Uranium-238, Dissolved	ug/L	4.4	100	100	106	108	102	103	70-130	1	20
Vanadium, Dissolved	ug/L	ND	100	100	102	104	102	103	70-130	2	20

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

QC Batch: 596214 Analysis Method: EPA 8082A
 QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 3223517 Matrix: Water
 Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/01/19 12:31	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/01/19 12:31	
Decachlorobiphenyl (S)	%	92	30-125	04/01/19 12:31	
Tetrachloro-m-xylene (S)	%	81	30-125	04/01/19 12:31	

LABORATORY CONTROL SAMPLE & LCSD: 3223518

3223519

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.6	81	81	45-125	0	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.9	1.8	97	92	49-125	5	20	
Decachlorobiphenyl (S)	%				102	95	30-125			
Tetrachloro-m-xylene (S)	%				58	61	30-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

QC Batch: 596311 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 3223890 Matrix: Water
Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/02/19 13:06	
2,4-Dichlorophenol	ug/L	ND	10.0	04/02/19 13:06	
2,4-Dimethylphenol	ug/L	ND	10.0	04/02/19 13:06	
2,4-Dinitrophenol	ug/L	ND	10.0	04/02/19 13:06	
2-Chlorophenol	ug/L	ND	10.0	04/02/19 13:06	
2-Methylnaphthalene	ug/L	ND	10.0	04/02/19 13:06	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/02/19 13:06	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/02/19 13:06	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/02/19 13:06	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/02/19 13:06	
Acenaphthene	ug/L	ND	10.0	04/02/19 13:06	
Anthracene	ug/L	ND	10.0	04/02/19 13:06	
Benzo(a)pyrene	ug/L	ND	10.0	04/02/19 13:06	
Benzoic acid	ug/L	ND	50.0	04/02/19 13:06	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/02/19 13:06	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/02/19 13:06	
Butylbenzylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Di-n-butylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Di-n-octylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Diethylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Dimethylphthalate	ug/L	ND	10.0	04/02/19 13:06	
Fluoranthene	ug/L	ND	10.0	04/02/19 13:06	
Fluorene	ug/L	ND	10.0	04/02/19 13:06	
Hexachlorobenzene	ug/L	ND	10.0	04/02/19 13:06	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/02/19 13:06	
Hexachloroethane	ug/L	ND	10.0	04/02/19 13:06	
Isophorone	ug/L	ND	10.0	04/02/19 13:06	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/02/19 13:06	
Pentachlorophenol	ug/L	ND	20.0	04/02/19 13:06	
Phenanthrene	ug/L	ND	10.0	04/02/19 13:06	
Phenol	ug/L	ND	10.0	04/02/19 13:06	
Pyrene	ug/L	ND	10.0	04/02/19 13:06	
2,4,6-Tribromophenol (S)	%	88	52-125	04/02/19 13:06	
2-Fluorobiphenyl (S)	%	73	52-125	04/02/19 13:06	
2-Fluorophenol (S)	%	69	30-125	04/02/19 13:06	
Nitrobenzene-d5 (S)	%	74	55-125	04/02/19 13:06	
p-Terphenyl-d14 (S)	%	86	57-125	04/02/19 13:06	
Phenol-d6 (S)	%	73	30-125	04/02/19 13:06	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

LABORATORY CONTROL SAMPLE & LCSD: 3223891		3223892									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	42.7	42.8	85	86	60-125	0	20		
2,4-Dichlorophenol	ug/L	50	39.2	37.7	78	75	56-125	4	20		
2,4-Dimethylphenol	ug/L	50	33.1	32.5	66	65	33-125	2	20		
2,4-Dinitrophenol	ug/L	50	31.8	32.7	64	65	32-125	3	20		
2-Chlorophenol	ug/L	50	37.6	35.1	75	70	52-125	7	20		
2-Methylnaphthalene	ug/L	50	39.0	38.3	78	77	52-125	2	20		
2-Methylphenol(o-Cresol)	ug/L	50	36.9	34.4	74	69	55-125	7	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.5	35.1	75	70	57-125	7	20		
3,3'-Dichlorobenzidine	ug/L	50	44J	44J	88	88	39-150		20		
4-Bromophenylphenyl ether	ug/L	50	46.4	45.7	93	91	61-125	1	20		
Acenaphthene	ug/L	50	43.0	43.0	86	86	59-125	0	20		
Anthracene	ug/L	50	47.3	46.5	95	93	64-125	2	20		
Benzo(a)pyrene	ug/L	50	43.9	43.8	88	88	63-125	0	20		
Benzoic acid	ug/L	50	33.5J	26.9J	67	54	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	37.3	35.1	75	70	49-125	6	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	45.6	46.2	91	92	68-125	1	20		
Butylbenzylphthalate	ug/L	50	46.1	45.6	92	91	67-125	1	20		
Di-n-butylphthalate	ug/L	50	49.3	47.7	99	95	67-125	3	20		
Di-n-octylphthalate	ug/L	50	46.0	46.4	92	93	67-125	1	20		
Diethylphthalate	ug/L	50	47.3	46.0	95	92	64-125	3	20		
Dimethylphthalate	ug/L	50	46.9	45.5	94	91	65-125	3	20		
Fluoranthene	ug/L	50	47.3	47.2	95	94	64-125	0	20		
Fluorene	ug/L	50	45.3	44.8	91	90	63-125	1	20		
Hexachlorobenzene	ug/L	50	48.4	49.2	97	98	61-125	2	20		
Hexachlorocyclopentadiene	ug/L	50	21.3J	ND	43	40	30-125		20		
Hexachloroethane	ug/L	50	34.5	32.3	69	65	30-125	6	20		
Isophorone	ug/L	50	41.4	40.7	83	81	59-125	2	20		
N-Nitrosodimethylamine	ug/L	50	38.6	35.5	77	71	43-125	8	20		
Pentachlorophenol	ug/L	50	43.3	41.7	87	83	35-125	4	20		
Phenanthrene	ug/L	50	46.4	46.2	93	92	65-125	0	20		
Phenol	ug/L	50	37.7	34.9	75	70	54-125	8	20		
Pyrene	ug/L	50	44.5	44.2	89	88	65-125	1	20		
2,4,6-Tribromophenol (S)	%				96	95	52-125				
2-Fluorobiphenyl (S)	%				79	78	52-125				
2-Fluorophenol (S)	%				72	68	30-125				
Nitrobenzene-d5 (S)	%				77	73	55-125				
p-Terphenyl-d14 (S)	%				85	84	57-125				
Phenol-d6 (S)	%				74	69	30-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

QC Batch: 596900

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 3227643

Matrix: Water

Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/02/19 03:39	

LABORATORY CONTROL SAMPLE: 3227644

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.7	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227645 3227646

Parameter	Units	10468903001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chloride	mg/L	37.2	12.5	12.5	42.1	42.2	39	40	90-110	0	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227647 3227648

Parameter	Units	10468903002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chloride	mg/L	48.6	12.5	12.5	51.4	51.3	22	21	90-110	0	20	M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

QC Batch: 596221

Analysis Method: SM 3500-Cr B Modified

QC Batch Method: SM 3500-Cr B Modified

Analysis Description: Chromium, Hexavalent by 3500

Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 3223534

Matrix: Water

Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/28/19 11:10	FS

LABORATORY CONTROL SAMPLE: 3223535

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	96	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3223536 3223537

Parameter	Units	10468460001		3223536		3223537		% Rec Limits	RPD	Max RPD	Qual		
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chromium, Hexavalent	mg/L	ND	ND	0.2	0.2	0.11	0.13	49	60	85-115	17	20	FS, H5, M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

QC Batch: 163578 Analysis Method: EPA 350.1 rev. 2 (1993)
 QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
 Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 644687 Matrix: Water
 Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	04/03/19 08:35	

LABORATORY CONTROL SAMPLE: 644688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 644689 644690

Parameter	Units	12123082002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	<0.11	5	5	5.2	5.0	103	101	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 644691 644692

Parameter	Units	10468606003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	6.3	5	5	11.2	11.4	97	101	90-110	2	10	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468606

QC Batch: 598592 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 3236543 Matrix: Water
Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/11/19 09:22	

LABORATORY CONTROL SAMPLE: 3236544

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	247	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3236545 3236546

Parameter	Units	10468606001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	250	250	251	243	100	97	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3236547 3236548

Parameter	Units	10468606002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cyanide	ug/L	ND	250	250	266	246	101	93	80-120	8	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	7.14 ± 2.92 (2.93) C:NA T:NA	pCi/L	04/03/19 08:02	12587-46-1	
Gross Beta		EPA 900.0	2.61 ± 1.64 (2.76) C:NA T:NA	pCi/L	04/03/19 08:02	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	4.17 ± 2.01 (2.78) C:NA T:NA	pCi/L	04/02/19 19:34	12587-46-1	
Gross Beta		EPA 900.0	7.64 ± 2.46 (3.35) C:NA T:NA	pCi/L	04/02/19 19:34	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	5.89 ± 2.11 (2.29) C:NA T:NA	pCi/L	04/02/19 19:34	12587-46-1	
Gross Beta		EPA 900.0	8.82 ± 2.45 (2.90) C:NA T:NA	pCi/L	04/02/19 19:34	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	5.65 ± 2.09 (2.30) C:NA T:NA	pCi/L	04/02/19 19:34	12587-46-1	
Gross Beta		EPA 900.0	6.80 ± 2.20 (2.97) C:NA T:NA	pCi/L	04/02/19 19:34	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468606

QC Batch: 336388

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

METHOD BLANK: 1637116

Matrix: Water

Associated Lab Samples: 10468606001, 10468606002, 10468606003, 10468606004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.490 ± 0.775 (1.71) C:NA T:NA	pCi/L	04/03/19 08:03	
Gross Beta	-0.139 ± 0.741 (1.85) C:NA T:NA	pCi/L	04/03/19 08:03	

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468606

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 596776

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

FS The sample was filtered in the laboratory prior to analysis.
H5 Reanalysis conducted in excess of EPA method holding time. Results confirm original analysis performed in hold time.
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468606

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10468606001	462520	EPA Mod. 3510C	596214	EPA 8082A	596776
10468606002	240818	EPA Mod. 3510C	596214	EPA 8082A	596776
10468606003	462523	EPA Mod. 3510C	596214	EPA 8082A	596776
10468606004	434011	EPA Mod. 3510C	596214	EPA 8082A	596776
10468606001	462520	EPA 200.7	596392	EPA 200.7	596765
10468606002	240818	EPA 200.7	596392	EPA 200.7	596765
10468606003	462523	EPA 200.7	596392	EPA 200.7	596765
10468606004	434011	EPA 200.7	596392	EPA 200.7	596765
10468606001	462520	EPA 200.8	596399	EPA 200.8	596862
10468606002	240818	EPA 200.8	596399	EPA 200.8	596862
10468606003	462523	EPA 200.8	596399	EPA 200.8	596862
10468606004	434011	EPA 200.8	596399	EPA 200.8	596862
10468606001	462520	EPA 3520	596311	EPA 8270D	596901
10468606002	240818	EPA 3520	596311	EPA 8270D	596901
10468606003	462523	EPA 3520	596311	EPA 8270D	596901
10468606004	434011	EPA 3520	596311	EPA 8270D	596901
10468606001	462520				
10468606002	240818				
10468606003	462523				
10468606004	434011				
10468606001	462520	EPA 900.0	336388		
10468606002	240818	EPA 900.0	336388		
10468606003	462523	EPA 900.0	336388		
10468606004	434011	EPA 900.0	336388		
10468606001	462520	EPA 300.0	596900		
10468606002	240818	EPA 300.0	596900		
10468606003	462523	EPA 300.0	596900		
10468606004	434011	EPA 300.0	596900		
10468606001	462520	SM 3500-Cr B Modified	596221		
10468606002	240818	SM 3500-Cr B Modified	596221		
10468606003	462523	SM 3500-Cr B Modified	596221		
10468606004	434011	SM 3500-Cr B Modified	596221		
10468606001	462520	EPA 350.1			
10468606002	240818	EPA 350.1			
10468606003	462523	EPA 350.1			
10468606004	434011	EPA 350.1			
10468606001	462520	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468606002	240818	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468606003	462523	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468606004	434011	EPA 350.1 rev. 2 (1993)	163578	EPA 350.1 rev. 2 (1993)	163646
10468606001	462520	SM 4500-CN-E	598592	SM 4500-CN-E	598682
10468606002	240818	SM 4500-CN-E	598592	SM 4500-CN-E	598682
10468606003	462523	SM 4500-CN-E	598592	SM 4500-CN-E	598682
10468606004	434011	SM 4500-CN-E	598592	SM 4500-CN-E	598682

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468606

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
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Chain-of-Custody Form rev 06/2013/0909

Work Order Number:

Turnaround Time:

WO#: 10468606

Page: / of /

FOR LAB USE ONLY

PROJECT/CLIENT INFO

Facility Code: MNSW-057 Program Code (MDH Lab Only): Lab No:
 Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters Project Task Code: PRJ07786 Addr: 10468606
 Project Manager: Brad Jacobson 612-607-6375 EPIC PROFILE #: 38716 Line 2 Minneapolis MN
 Potential Hazard? If yes, add information to Sampler Comments Section Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES

Wtr-Ground=Groundwater
 Wtr-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

PRESERV.

None H2O2 None H2O2 None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/Un-ionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SVOC, 8062, MDA1, MDA2 - QAPP Table 3a	Lab Sample No.	#
462520	sample	3/28/19	1125			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	01	1
240818	sample	3/28/19	1100			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	02	2
462523	sample	3/28/19	1230			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	03	3
434011	sample	3/28/19	1420			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	04	4
									N											5
									N											6
									N											7
									N											8
									N											9
									N											10

DATA 3/28/19

Sampled By: David Anderson / Chris Pelosi Sampler's Signature: David Anderson Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	3/28/19/1455	[Signature] 2 free	3/28/19 1455

2.9°C
 3.0°C
 5.0°C
 5.5°C

Sample Condition Upon Receipt Client Name: MPCA Project #: **WO# : 10468606**

Courier: Fed Ex UPS USPS Client
 Pace Speedee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No

Thermometer: G87A9155100842 G87A9170600254 Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>2.9, 3.0, 5.0, 5.5</u> °C	Average Corrected Temp (no temp blank only): _____ °C	See Exceptions <input type="checkbox"/>
Correction Factor: <u>True</u>	Cooler Temp Corrected w/temp blank: <u>2.9, 3.0, 5.0, 5.5</u> °C	_____ °C	

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: JT 3/28/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <u>JMA</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: See Exception <input type="checkbox"/>
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate <u>1-4 1/2</u> <u>1-4 1/2</u> <u>1-4 1/2</u>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. Chlorine? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No See Exception <input type="checkbox"/>
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No

Comments/Resolution: _____

Project Manager Review: [Signature] Date: 03/29/2019

Note: Whenever there is a discrepancy between North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: [Signature]



Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN
Cert. Needed: Yes No

Workorder: 10468606 Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Owner Received Date: 3/28/2019 Results Requested By: 4/18/2019

Report To		Subcontract To					Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<div style="float: right; text-align: right;"> 350.1 Ammonia Unionized Ammonia </div>															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers													LAB USE ONLY			
						H2SO4 BP3S																
1	462520	PS	3/28/2019 11:25	10468606001	Water	1					X	X										
2	240818	PS	3/28/2019 11:00	10468606002	Water	1					X	X										
3	462523	PS	3/28/2019 12:30	10468606003	Water	1					X	X										
4	434011	PS	3/28/2019 14:20	10468606004	Water	1					X	X										
5																						
												Comments										
Transfers	Released By	Date/Time	Received By	Date/Time																		
1	<i>[Signature]</i>	3/29/19 1740	<i>[Signature]</i>	3/29/19 1700																		
2	<i>[Signature]</i>	3/29/19 2210	<i>[Signature]</i>	4/1/19 08:00																		
3																						
Cooler Temperature on Receipt 0.8 °C		Custody Seal (Y) or N		Received on Ice (Y) or N		Samples Intact (Y) or N																

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO#: 12123040

PM: CLJ Due Date: 04/18/19
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.5 Cooler Temp Corrected °C: 0.8 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 2/29/19 DC

Comments: RM 4/1/19

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

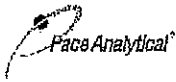
Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Katie Richards Date: 4/1/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: PACE MIN

Project # 30286883

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 41038 0195 6332

Label	<u>BMH</u>
LIMS Login	<u>BMH</u>

Custody Seal on Cooler/Box Present: yes no Seals Intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature _____ Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>BMH 4/1/19</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>PH12</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>BMH</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	/			17.
Trip Blank Present:	/			18.
Trip Blank Custody Seals Present	/			
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>BMH</u> Date: <u>4/1/19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



12-Apr-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10468606**

Work Order: **1904010**

Dear Jennifer,

ALS Environmental received 4 samples on 30-Mar-2019 09:45 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 10.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10468606
Work Order: 1904010

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1904010-01	462520	Water		3/28/2019 11:25	3/30/2019 09:45	<input type="checkbox"/>
1904010-02	240818	Water		3/28/2019 11:00	3/30/2019 09:45	<input type="checkbox"/>
1904010-03	462523	Water		3/28/2019 12:30	3/30/2019 09:45	<input type="checkbox"/>
1904010-04	434011	Water		3/28/2019 14:20	3/30/2019 09:45	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10468606
WorkOrder: 1904010

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468606

Work Order: 1904010

Sample ID: 462520

Lab ID: 1904010-01

Collection Date: 3/28/2019 11:25 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468606

Work Order: 1904010

Sample ID: 240818

Lab ID: 1904010-02

Collection Date: 3/28/2019 11:00 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468606

Work Order: 1904010

Sample ID: 462523

Lab ID: 1904010-03

Collection Date: 3/28/2019 12:30 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468606

Work Order: 1904010

Sample ID: 434011

Lab ID: 1904010-04

Collection Date: 3/28/2019 02:20 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 1904010
Project: 10468606

QC BATCH REPORT

Batch ID: **R258103** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R258103-R258103				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596554		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free ND 20

LCS		Sample ID: LCS-R258103-R258103				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596555		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 264.9 20 250 0 106 81-119 0

MS		Sample ID: 1904010-01A MS				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID: 462520		Run ID: WETCHEM_190408Q		SeqNo: 5596560		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 264.9 20 250 -6.48 109 81-119 0

MSD		Sample ID: 1904010-01A MSD				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID: 462520		Run ID: WETCHEM_190408Q		SeqNo: 5596561		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 247.2 20 250 -6.48 101 81-119 264.9 6.91 20

The following samples were analyzed in this batch:

1904010-01A	1904010-02A	1904010-03A
1904010-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1903010

Chain of Custody



Workorder: 10468606

Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Results Requested By: 4/18/2019

Report / Invoice To		Subcontract To				Requested Analysis										LAB USE ONLY					
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436 Email: jennifer.anderson@pacelabs.com		ALS 3352 128th Avenue Holland, MI 49424				P.O. 10468606															
State of Sample Origin: MN		Preserved Containers										Free Cyanide									
Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Other BP3A																
1	462520	3/28/2019 11:25	10468606001	Water	1																X
2	240818	3/28/2019 11:00	10468606002	Water	1																X
3	462523	3/28/2019 12:30	10468606003	Water	1																X
4	434011	3/28/2019 14:20	10468606004	Water	1																X
5																					
Transfers										Comments											
	Released By	Date/Time	Received By		Date/Time																
1		3/29/19 14:55			3/30/19 09:15																
2																					
3																					
Cooler Temperature on Receipt		2.4 °C	Custody Seal		Y or N	Received on Ice		Y or N	Samples Intact										Y or N		

SR2



SIGNATURE

DATE 3/29

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **30-Mar-19 09:45**

Work Order: **1904010**

Received by: **DS**

Checklist completed by Diane Shaw 01-Apr-19
eSignature Date

Reviewed by: Chad Whilton 02-Apr-19
eSignature Date

Matrices: Water

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No
- Sample(s) received on ice? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 15, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 03/30/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2019
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
462520	A191325-01	Water	03/28/2019	03/30/2019
240818	A191325-02	Water	03/28/2019	03/30/2019
462523	A191325-03	Water	03/28/2019	03/30/2019
434011	A191325-04	Water	03/28/2019	03/30/2019

CASE NARRATIVE

Sample Receipt Information:

4 samples were received on 03/30/2019. Samples were received at 2.3 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The E1 footnote on samples A191325-01 through A191325-04 indicates that there were quality control sample exceedances for terbufos. The LCS recovery was below acceptable limits. Please see the quality control section of the report for more information.

The LCS and LCS duplicate recoveries indicate a potential high bias for ethalfluralin, fonofos, propachlor and triallate for samples A191325-01 through A191325-04. Samples were less than the reporting limit for these analytes so no further action is required.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for triallate and trifluralin for samples A191325-01 through A191325-04. Samples were less than the reporting limit for these analytes so no further action is required.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

462520

Date Sampled

A191325-01 (Water)

03/28/2019 11:25

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 19:33	EPA 8270D	
Surrogate: Atrazine-d5		80.8 %		56.9-123	04/04/2019	04/08/2019 19:33	EPA 8270D	
Surrogate: Parathion-d10		121 %		23.8-169	04/04/2019	04/08/2019 19:33	EPA 8270D	
Surrogate: Triphenyl phosphate		69.0 %		50.5-178	04/04/2019	04/08/2019 19:33	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 07:08	EPA 8151A	
Surrogate: 2,4-D-d5		79.6 %		44.2-121	04/03/2019	04/07/2019 07:08	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

240818

Date Sampled

A191325-02 (Water)

03/28/2019 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:01	EPA 8270D	
Surrogate: Atrazine-d5		91.9 %	56.9-123		04/04/2019	04/08/2019 20:01	EPA 8270D	
Surrogate: Parathion-d10		196 %	23.8-169		04/04/2019	04/08/2019 20:01	EPA 8270D	S
Surrogate: Triphenyl phosphate		95.0 %	50.5-178		04/04/2019	04/08/2019 20:01	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/12/2019 22:30	EPA 8151A	
Surrogate: 2,4-D-d5		73.7 %	44.2-121		04/03/2019	04/12/2019 22:30	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

462523

Date Sampled

A191325-03 (Water)

03/28/2019 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:29	EPA 8270D	
Surrogate: Atrazine-d5		88.8 %		56.9-123	04/04/2019	04/08/2019 20:29	EPA 8270D	
Surrogate: Parathion-d10		117 %		23.8-169	04/04/2019	04/08/2019 20:29	EPA 8270D	
Surrogate: Triphenyl phosphate		98.1 %		50.5-178	04/04/2019	04/08/2019 20:29	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 08:19	EPA 8151A	
Surrogate: 2,4-D-d5		81.2 %		44.2-121	04/03/2019	04/07/2019 08:19	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

434011

A191325-04 (Water)

Date Sampled

03/28/2019 14:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/08/2019 20:57	EPA 8270D	
Surrogate: Atrazine-d5		97.3 %		56.9-123	04/04/2019	04/08/2019 20:57	EPA 8270D	
Surrogate: Parathion-d10		177 %		23.8-169	04/04/2019	04/08/2019 20:57	EPA 8270D	S
Surrogate: Triphenyl phosphate		100 %		50.5-178	04/04/2019	04/08/2019 20:57	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/12/2019 23:05	EPA 8151A	
Surrogate: 2,4-D-d5		86.1 %		44.2-121	04/03/2019	04/12/2019 23:05	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904147 - EPA 3510C

Blank (A904147-BLK1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:08

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>0.511</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>1.07</i>		<i>ug/L</i>	<i>0.5000</i>		<i>215</i>	<i>23.8-169</i>			<i>S</i>
<i>Surrogate: Triphenyl phosphate</i>	<i>0.453</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.6</i>	<i>50.5-178</i>			

LCS (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:36

Acetochlor	0.817	0.50	ug/L	1.000		81.7	67.8-122			
Alachlor	0.819	0.50	ug/L	1.000		81.9	68.6-119			
Atrazine	0.802	0.50	ug/L	1.000		80.2	68.6-115			
Chlorpyrifos	0.841	0.50	ug/L	1.000		84.1	63.1-120			
Cyanazine	0.832	0.20	ug/L	1.000		83.2	55.3-143			
Desethylatrazine	0.766	0.50	ug/L	1.000		76.6	67.8-115			
Deisopropylatrazine	0.594	0.50	ug/L	1.000		59.4	50.1-100			
Dimethenamid	0.795	0.50	ug/L	1.000		79.5	70.3-121			
EPTC	0.649	0.50	ug/L	1.000		64.9	50.4-101			
Ethalfuralin	1.87	0.50	ug/L	1.000		187	42.6-121			
Fonofos	1.62	0.50	ug/L	1.000		162	56.6-119			
Metolachlor	0.822	0.50	ug/L	1.000		82.2	71.3-128			
Metribuzin	0.760	0.50	ug/L	1.000		76.0	64.9-120			
Pendimethalin	0.841	0.50	ug/L	1.000		84.1	60.9-128			
Phorate	0.477	0.30	ug/L	1.000		47.7	37.3-112			
Prometon	0.799	0.50	ug/L	1.000		79.9	67.1-120			
Propachlor	1.92	0.50	ug/L	1.000		192	66.2-127			
Propazine	0.800	0.50	ug/L	1.000		80.0	68.2-118			
Simazine	0.800	0.50	ug/L	1.000		80.0	67.2-117			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904147 - EPA 3510C

LCS (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:36

Terbufos	0.283	0.20	ug/L	1.000		28.3	34.3-111			
Triallate	1.82	0.50	ug/L	1.000		182	53-121			
Trifluralin	0.759	0.50	ug/L	1.000		75.9	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.447</i>		<i>ug/L</i>	<i>0.5000</i>		<i>89.4</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.952</i>		<i>ug/L</i>	<i>0.5000</i>		<i>190</i>	<i>23.8-169</i>			S
<i>Surrogate: Triphenyl phosphate</i>	<i>0.418</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.5</i>	<i>50.5-178</i>			

LCS Dup (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 19:04

Acetochlor	0.885	0.50	ug/L	1.000		88.5	67.8-122	7.93	20	
Alachlor	0.867	0.50	ug/L	1.000		86.7	68.6-119	5.69	20	
Atrazine	0.846	0.50	ug/L	1.000		84.6	68.6-115	5.34	20	
Chlorpyrifos	0.897	0.50	ug/L	1.000		89.7	63.1-120	6.43	20	
Cyanazine	0.904	0.20	ug/L	1.000		90.4	55.3-143	8.21	20	
Desethylatrazine	0.822	0.50	ug/L	1.000		82.2	67.8-115	7.00	20	
Deisopropylatrazine	0.616	0.50	ug/L	1.000		61.6	50.1-100	3.55	20	
Dimethenamid	0.855	0.50	ug/L	1.000		85.5	70.3-121	7.20	20	
EPTC	0.742	0.50	ug/L	1.000		74.2	50.4-101	13.3	20	
Ethalfuralin	1.47	0.50	ug/L	1.000		147	42.6-121	24.0	20	X
Fonofos	1.35	0.50	ug/L	1.000		135	56.6-119	17.8	20	
Metolachlor	0.886	0.50	ug/L	1.000		88.6	71.3-128	7.43	20	
Metribuzin	0.789	0.50	ug/L	1.000		78.9	64.9-120	3.69	20	
Pendimethalin	0.888	0.50	ug/L	1.000		88.8	60.9-128	5.41	20	
Phorate	0.541	0.30	ug/L	1.000		54.1	37.3-112	12.7	20	
Prometon	0.831	0.50	ug/L	1.000		83.1	67.1-120	3.92	20	
Propachlor	1.63	0.50	ug/L	1.000		163	66.2-127	16.7	20	
Propazine	0.874	0.50	ug/L	1.000		87.4	68.2-118	8.91	20	
Simazine	0.883	0.50	ug/L	1.000		88.3	67.2-117	9.75	20	
Terbufos	0.366	0.20	ug/L	1.000		36.6	34.3-111	25.7	20	X
Triallate	1.57	0.50	ug/L	1.000		157	53-121	14.6	20	
Trifluralin	0.805	0.50	ug/L	1.000		80.5	45.9-116	5.95	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.478</i>		<i>ug/L</i>	<i>0.5000</i>		<i>95.7</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.842</i>		<i>ug/L</i>	<i>0.5000</i>		<i>168</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.410</i>		<i>ug/L</i>	<i>0.5000</i>		<i>82.1</i>	<i>50.5-178</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904142 - EPA 3510C

Blank (A904142-BLK1)

Prepared: 04/03/2019 Analyzed: 04/06/2019 23:26

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
Surrogate: 2,4-D-d5	1.51		ug/L	2.006		75.1	44.2-121			

LCS (A904142-BS1)

Prepared: 04/03/2019 Analyzed: 04/07/2019 00:01

2,4-D	1.90	0.50	ug/L	2.000		95.1	64.6-148			
2,4-DB	1.80	0.50	ug/L	2.000		89.9	66.7-143			
2,4,5-T	1.80	0.50	ug/L	2.000		90.1	63.4-133			
2,4,5-TP (Silvex)	1.68	0.50	ug/L	2.000		84.1	63-145			
Bentazon	0.679	0.50	ug/L	1.000		67.9	52.5-139			
Dicamba	1.61	0.50	ug/L	2.000		80.6	55.4-143			
MCPA	1.45	0.30	ug/L	2.000		72.4	33.5-143			
Picloram	0.740	0.50	ug/L	1.000		74.0	47.9-113			
Triclopyr	1.62	0.50	ug/L	2.000		80.9	65.1-141			
Surrogate: 2,4-D-d5	1.60		ug/L	2.006		79.6	44.2-121			

LCS Dup (A904142-BSD1)

Prepared: 04/03/2019 Analyzed: 04/07/2019 00:37

2,4-D	1.73	0.50	ug/L	2.000		86.4	64.6-148	9.56	20	
2,4-DB	1.63	0.50	ug/L	2.000		81.6	66.7-143	9.67	20	
2,4,5-T	1.67	0.50	ug/L	2.000		83.5	63.4-133	7.57	20	
2,4,5-TP (Silvex)	1.59	0.50	ug/L	2.000		79.3	63-145	5.92	20	
Bentazon	0.656	0.50	ug/L	1.000		65.6	52.5-139	3.52	20	
Dicamba	1.64	0.50	ug/L	2.000		81.8	55.4-143	1.47	20	
MCPA	1.45	0.30	ug/L	2.000		72.4	33.5-143	0.0138	20	
Picloram	0.714	0.50	ug/L	1.000		71.4	47.9-113	3.60	20	
Triclopyr	1.56	0.50	ug/L	2.000		77.9	65.1-141	3.79	20	
Surrogate: 2,4-D-d5	1.47		ug/L	2.006		73.2	44.2-121			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468606
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- E1 Estimated value because of quality control sample exceedances.
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

A191325

Chain of Custody



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Owner Received Date: 3/28/2019 Results Requested By: 4/18/2019

Workorder: 10468606 Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Report To		Subcontract To					Requested Analysis																		
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																							
						Preserved Containers																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved	AGIT																		LAB USE ONLY
1	462520	PS	3/28/2019 11:25	10468606001	Water	4																			01
2	240818	PS	3/28/2019 11:00	10468606002	Water	4																			02
3	462523	PS	3/28/2019 12:30	10468606003	Water	4																			03
4	434011	PS	3/28/2019 14:20	10468606004	Water	4																			04
5																									
																		Comments							
Transfers	Released By	Date/Time	Received By	Date/Time																					
1	<i>[Signature]</i>	3/28/19 1520	<i>[Signature]</i>	1200	Need MPCA Equis EDD and Barr Equis 5 EDD																				
2																									
3																									
Cooler Temperature on Receipt		2.3 °C		Custody Seal Y or <u>(N)</u>		Received on Ice <u>(Y)</u> or N		Samples Intact <u>(Y)</u> or N																	

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Thermometer S/N: 160142274
exp: 7/13/19

April 17, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468813

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on March 29, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468813

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683

Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10468813001	462521	Water	03/29/19 13:00	03/29/19 14:20
10468813002	M-2	Water	03/29/19 13:05	03/29/19 14:20
10468813003	462522	Water	03/29/19 13:50	03/29/19 14:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10468813001	462521	EPA 8082A	RAG	11	PASI-M		
		EPA 200.7	IP	9	PASI-M		
		EPA 200.8	RJS	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	NEG	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10468813002	M-2	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	IP	9	PASI-M
EPA 200.8	RJS			12	PASI-M		
EPA 8270D	STB			38	PASI-M		
EPA 900.0	NEG			2	PASI-PA		
EPA 300.0	KEO			1	PASI-M		
SM 3500-Cr B Modified	JFP			1	PASI-M		
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V		
SM 4500-CN-E	DCL			1	PASI-M		
10468813003	462522			EPA 8082A	RAG	11	PASI-M
				EPA 200.7	IP	9	PASI-M
				EPA 200.8	RJS	12	PASI-M
				EPA 8270D	STB	38	PASI-M
			CLJ	16	PASI-V		
		EPA 900.0	NEG	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Sample: 462521	Lab ID: 10468813001	Collected: 03/29/19 13:00	Received: 03/29/19 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.095	1	03/29/19 16:36	04/01/19 11:15	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	66	%	30-125	1	03/29/19 16:36	04/01/19 11:15	877-09-8	
Decachlorobiphenyl (S)	75	%	30-125	1	03/29/19 16:36	04/01/19 11:15	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/02/19 05:55	04/05/19 16:55	7429-90-5	
Barium, Dissolved	302	ug/L	10.0	1	04/02/19 05:55	04/05/19 16:55	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/02/19 05:55	04/05/19 16:55	7440-50-8	
Manganese, Dissolved	60.0	ug/L	5.0	1	04/02/19 05:55	04/05/19 16:55	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/02/19 05:55	04/05/19 16:55	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/02/19 05:55	04/05/19 16:55	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/02/19 05:55	04/05/19 16:55	7440-31-5	
Total Hardness by 2340B, Dissolved	315000	ug/L	3300	1	04/02/19 05:55	04/05/19 16:55		
Zinc, Dissolved	ND	ug/L	20.0	1	04/02/19 05:55	04/05/19 16:55	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:13	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:13	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/02/19 05:55	04/15/19 18:13	7440-41-7	
Boron, Dissolved	47.2	ug/L	10.0	1	04/02/19 05:55	04/15/19 18:13	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/02/19 05:55	04/15/19 18:13	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:13	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:13	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/02/19 05:55	04/15/19 18:13	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:13	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/02/19 05:55	04/15/19 18:13	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:13	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/02/19 05:55	04/15/19 18:13	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	83-32-9	
Anthracene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	50-32-8	
Benzoic acid	ND	ug/L	48.8	1	04/01/19 19:25	04/03/19 16:53	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Sample: 462521 Lab ID: 10468813001 Collected: 03/29/19 13:00 Received: 03/29/19 14:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.8	1	04/01/19 19:25	04/03/19 16:53	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	206-44-0	
Fluorene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.8	1	04/01/19 19:25	04/03/19 16:53	77-47-4	L2
Hexachloroethane	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	67-72-1	
Isophorone	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.5	1	04/01/19 19:25	04/03/19 16:53		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	62-75-9	
Pentachlorophenol	ND	ug/L	19.5	1	04/01/19 19:25	04/03/19 16:53	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	85-01-8	
Phenol	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	108-95-2	
Pyrene	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	04/01/19 19:25	04/03/19 16:53	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%.	55-125	1	04/01/19 19:25	04/03/19 16:53	4165-60-0	
2-Fluorobiphenyl (S)	73	%.	52-125	1	04/01/19 19:25	04/03/19 16:53	321-60-8	
p-Terphenyl-d14 (S)	86	%.	57-125	1	04/01/19 19:25	04/03/19 16:53	1718-51-0	
Phenol-d6 (S)	76	%.	30-125	1	04/01/19 19:25	04/03/19 16:53	13127-88-3	
2-Fluorophenol (S)	74	%.	30-125	1	04/01/19 19:25	04/03/19 16:53	367-12-4	
2,4,6-Tribromophenol (S)	91	%.	52-125	1	04/01/19 19:25	04/03/19 16:53	118-79-6	

Field Data

Analytical Method:

Collected Date	03/29/19			1		03/29/19 13:00		
Collected Time	1300			1		03/29/19 13:00		
Field pH	7.5	Std. Units		1		03/29/19 13:00		
Field Temperature	12.0	deg C		1		03/29/19 13:00		
Field Specific Conductance	680	umhos/cm		1		03/29/19 13:00		
Oxygen, Dissolved	0.1	mg/L		1		03/29/19 13:00	7782-44-7	
REDOX	-177	mV		1		03/29/19 13:00		
Turbidity	4.5	NTU		1		03/29/19 13:00		
Apparent Color	Clear			1		03/29/19 13:00		
Odor	No			1		03/29/19 13:00		
Well Locked	Yes			1		03/29/19 13:00		
Purge Method	Grundfos Redi-Flo			1		03/29/19 13:00		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Sample: 462521		Lab ID: 10468813001		Collected: 03/29/19 13:00	Received: 03/29/19 14:20	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Total Well Depth	187.0	feet		1		03/29/19 13:00		
Depth of Water	39.20			1		03/29/19 13:00		
Well Volume Purged	294.0			1		03/29/19 13:00		
Purge Rate	3.5			1		03/29/19 13:00		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	55.3	mg/L	1.2	1		04/02/19 11:30	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/30/19 12:22		FS
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/11/19 14:41		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	0.30	mg/L	0.11	1	04/09/19 08:29	04/09/19 12:20	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 10:36	57-12-5	

Sample: M-2		Lab ID: 10468813002		Collected: 03/29/19 13:05	Received: 03/29/19 14:20	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:31	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	61	%	30-125	1	03/29/19 16:36	04/01/19 11:31	877-09-8	
Decachlorobiphenyl (S)	72	%	30-125	1	03/29/19 16:36	04/01/19 11:31	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/02/19 05:55	04/05/19 17:03	7429-90-5	
Barium, Dissolved	305	ug/L	10.0	1	04/02/19 05:55	04/05/19 17:03	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/02/19 05:55	04/05/19 17:03	7440-50-8	
Manganese, Dissolved	61.5	ug/L	5.0	1	04/02/19 05:55	04/05/19 17:03	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/02/19 05:55	04/05/19 17:03	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/02/19 05:55	04/05/19 17:03	7440-22-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Sample: M-2	Lab ID: 10468813002	Collected: 03/29/19 13:05	Received: 03/29/19 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Tin, Dissolved	ND	ug/L	75.0	1	04/02/19 05:55	04/05/19 17:03	7440-31-5	
Total Hardness by 2340B, Dissolved	318000	ug/L	3300	1	04/02/19 05:55	04/05/19 17:03		
Zinc, Dissolved	ND	ug/L	20.0	1	04/02/19 05:55	04/05/19 17:03	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:22	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:22	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/02/19 05:55	04/15/19 18:22	7440-41-7	
Boron, Dissolved	50.1	ug/L	10.0	1	04/02/19 05:55	04/15/19 18:22	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/02/19 05:55	04/15/19 18:22	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:22	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:22	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/02/19 05:55	04/15/19 18:22	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:22	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/02/19 05:55	04/15/19 18:22	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:22	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/02/19 05:55	04/15/19 18:22	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	83-32-9	
Anthracene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	50-32-8	
Benzoic acid	ND	ug/L	47.4	1	04/01/19 19:25	04/03/19 17:18	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	111-44-4	
2-Chlorophenol	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	47.4	1	04/01/19 19:25	04/03/19 17:18	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	120-83-2	
Diethylphthalate	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	105-67-9	
Dimethylphthalate	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	117-81-7	
Fluoranthene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	206-44-0	
Fluorene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	86-73-7	
Hexachlorobenzene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	47.4	1	04/01/19 19:25	04/03/19 17:18	77-47-4	L2
Hexachloroethane	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	67-72-1	
Isophorone	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.0	1	04/01/19 19:25	04/03/19 17:18		
N-Nitrosodimethylamine	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Sample Project No.: 10468813

Sample: M-2	Lab ID: 10468813002	Collected: 03/29/19 13:05	Received: 03/29/19 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Pentachlorophenol	ND	ug/L	19.0	1	04/01/19 19:25	04/03/19 17:18	87-86-5	
Phenanthrene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	85-01-8	
Phenol	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	108-95-2	
Pyrene	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.5	1	04/01/19 19:25	04/03/19 17:18	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	81	%	55-125	1	04/01/19 19:25	04/03/19 17:18	4165-60-0	
2-Fluorobiphenyl (S)	75	%	52-125	1	04/01/19 19:25	04/03/19 17:18	321-60-8	
p-Terphenyl-d14 (S)	86	%	57-125	1	04/01/19 19:25	04/03/19 17:18	1718-51-0	
Phenol-d6 (S)	80	%	30-125	1	04/01/19 19:25	04/03/19 17:18	13127-88-3	
2-Fluorophenol (S)	78	%	30-125	1	04/01/19 19:25	04/03/19 17:18	367-12-4	
2,4,6-Tribromophenol (S)	94	%	52-125	1	04/01/19 19:25	04/03/19 17:18	118-79-6	
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	54.1	mg/L	1.2	1		04/02/19 11:45	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		03/30/19 12:22		FS
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	0.29	mg/L	0.11	1	04/09/19 08:29	04/09/19 12:22	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 10:39	57-12-5	
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Sample: 462522	Lab ID: 10468813003	Collected: 03/29/19 13:50	Received: 03/29/19 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	03/29/19 16:36	04/01/19 11:46	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	30-125	1	03/29/19 16:36	04/01/19 11:46	877-09-8	
Decachlorobiphenyl (S)	77	%	30-125	1	03/29/19 16:36	04/01/19 11:46	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/02/19 05:55	04/05/19 17:06	7429-90-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Sample: 462522	Lab ID: 10468813003	Collected: 03/29/19 13:50	Received: 03/29/19 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Dissolved	255	ug/L	10.0	1	04/02/19 05:55	04/05/19 17:06	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/02/19 05:55	04/05/19 17:06	7440-50-8	
Manganese, Dissolved	8.2	ug/L	5.0	1	04/02/19 05:55	04/05/19 17:06	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/02/19 05:55	04/05/19 17:06	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/02/19 05:55	04/05/19 17:06	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/02/19 05:55	04/05/19 17:06	7440-31-5	
Total Hardness by 2340B, Dissolved	321000	ug/L	3300	1	04/02/19 05:55	04/05/19 17:06		
Zinc, Dissolved	ND	ug/L	20.0	1	04/02/19 05:55	04/05/19 17:06	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:17	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:17	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/02/19 05:55	04/15/19 18:17	7440-41-7	
Boron, Dissolved	145	ug/L	10.0	1	04/02/19 05:55	04/15/19 18:17	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/02/19 05:55	04/15/19 18:17	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:17	7440-47-3	
Cobalt, Dissolved	0.63	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:17	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/02/19 05:55	04/15/19 18:17	7439-92-1	
Selenium, Dissolved	1.4	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:17	7782-49-2	
Thallium, Dissolved	0.20	ug/L	0.10	1	04/02/19 05:55	04/15/19 18:17	7440-28-0	
Uranium-238, Dissolved	1.4	ug/L	0.50	1	04/02/19 05:55	04/15/19 18:17	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/02/19 05:55	04/15/19 18:17	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	83-32-9	
Anthracene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	50-32-8	
Benzoic acid	ND	ug/L	48.5	1	04/01/19 19:25	04/03/19 17:42	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	111-44-4	
2-Chlorophenol	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.5	1	04/01/19 19:25	04/03/19 17:42	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	120-83-2	
Diethylphthalate	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	105-67-9	
Dimethylphthalate	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	117-81-7	
Fluoranthene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	206-44-0	
Fluorene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	86-73-7	
Hexachlorobenzene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.5	1	04/01/19 19:25	04/03/19 17:42	77-47-4	L2
Hexachloroethane	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	67-72-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Sample: 462522	Lab ID: 10468813003	Collected: 03/29/19 13:50	Received: 03/29/19 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Isophorone	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.4	1	04/01/19 19:25	04/03/19 17:42		
N-Nitrosodimethylamine	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	62-75-9	
Pentachlorophenol	ND	ug/L	19.4	1	04/01/19 19:25	04/03/19 17:42	87-86-5	
Phenanthrene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	85-01-8	
Phenol	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	108-95-2	
Pyrene	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.7	1	04/01/19 19:25	04/03/19 17:42	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	85	%.	55-125	1	04/01/19 19:25	04/03/19 17:42	4165-60-0	
2-Fluorobiphenyl (S)	80	%.	52-125	1	04/01/19 19:25	04/03/19 17:42	321-60-8	
p-Terphenyl-d14 (S)	90	%.	57-125	1	04/01/19 19:25	04/03/19 17:42	1718-51-0	
Phenol-d6 (S)	82	%.	30-125	1	04/01/19 19:25	04/03/19 17:42	13127-88-3	
2-Fluorophenol (S)	80	%.	30-125	1	04/01/19 19:25	04/03/19 17:42	367-12-4	
2,4,6-Tribromophenol (S)	100	%.	52-125	1	04/01/19 19:25	04/03/19 17:42	118-79-6	
Field Data		Analytical Method:						
Collected Date	03/29/19			1		03/29/19 13:50		
Collected Time	1350			1		03/29/19 13:50		
Field pH	6.9	Std. Units		1		03/29/19 13:50		
Field Temperature	13.0	deg C		1		03/29/19 13:50		
Field Specific Conductance	730	umhos/cm		1		03/29/19 13:50		
Oxygen, Dissolved	1.2	mg/L		1		03/29/19 13:50	7782-44-7	
REDOX	54	mV		1		03/29/19 13:50		
Turbidity	3.4	NTU		1		03/29/19 13:50		
Apparent Color	Clear			1		03/29/19 13:50		
Odor	No			1		03/29/19 13:50		
Well Locked	Yes			1		03/29/19 13:50		
Purge Method	Grundfos Redi-Flo			1		03/29/19 13:50		
Total Well Depth	81.73	feet		1		03/29/19 13:50		
Depth of Water	60.02			1		03/29/19 13:50		
Well Volume Purged	48.0			1		03/29/19 13:50		
Purge Rate	2.0			1		03/29/19 13:50		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	30.2	mg/L	1.2	1		04/02/19 12:00	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		03/30/19 12:22		FS
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/11/19 14:42		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Sample: 462522 Lab ID: 10468813003 Collected: 03/29/19 13:50 Received: 03/29/19 14:20 Matrix: Water								
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	0.50	mg/L	0.11	1	04/09/19 08:29	04/09/19 12:23	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 10:39	57-12-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

QC Batch: 596975 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 3228238 Matrix: Water

Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/05/19 16:49	
Barium, Dissolved	ug/L	ND	10.0	04/05/19 16:49	
Copper, Dissolved	ug/L	ND	10.0	04/05/19 16:49	
Manganese, Dissolved	ug/L	ND	5.0	04/05/19 16:49	
Nickel, Dissolved	ug/L	ND	20.0	04/05/19 16:49	
Silver, Dissolved	ug/L	ND	10.0	04/05/19 16:49	
Tin, Dissolved	ug/L	ND	75.0	04/05/19 16:49	
Zinc, Dissolved	ug/L	ND	20.0	04/05/19 16:49	

LABORATORY CONTROL SAMPLE: 3228239

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	19900	99	85-115	
Barium, Dissolved	ug/L	1000	993	99	85-115	
Copper, Dissolved	ug/L	1000	956	96	85-115	
Manganese, Dissolved	ug/L	1000	1000	100	85-115	
Nickel, Dissolved	ug/L	1000	970	97	85-115	
Silver, Dissolved	ug/L	500	488	98	85-115	
Tin, Dissolved	ug/L	1000	992	99	85-115	
Zinc, Dissolved	ug/L	1000	966	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3228240 3228241

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10468813001 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Aluminum, Dissolved	ug/L	ND	20000	20000	20100	20700	101	103	70-130	3	20
Barium, Dissolved	ug/L	302	1000	1000	1290	1320	98	101	70-130	2	20
Copper, Dissolved	ug/L	ND	1000	1000	960	982	96	98	70-130	2	20
Manganese, Dissolved	ug/L	60.0	1000	1000	1050	1070	99	101	70-130	2	20
Nickel, Dissolved	ug/L	ND	1000	1000	946	973	95	97	70-130	3	20
Silver, Dissolved	ug/L	ND	500	500	492	504	98	101	70-130	2	20
Tin, Dissolved	ug/L	ND	1000	1000	968	989	97	99	70-130	2	20
Zinc, Dissolved	ug/L	ND	1000	1000	940	962	94	96	70-130	2	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

QC Batch: 596976 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 3228242 Matrix: Water

Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/15/19 18:08	
Arsenic, Dissolved	ug/L	ND	0.50	04/15/19 18:08	
Beryllium, Dissolved	ug/L	ND	0.20	04/15/19 18:08	
Boron, Dissolved	ug/L	ND	10.0	04/15/19 18:08	
Cadmium, Dissolved	ug/L	ND	0.080	04/15/19 18:08	
Chromium, Dissolved	ug/L	ND	0.50	04/15/19 18:08	
Cobalt, Dissolved	ug/L	ND	0.50	04/15/19 18:08	
Lead, Dissolved	ug/L	ND	0.10	04/15/19 18:08	
Selenium, Dissolved	ug/L	ND	0.50	04/15/19 18:08	
Thallium, Dissolved	ug/L	ND	0.10	04/15/19 18:08	
Uranium-238, Dissolved	ug/L	ND	0.50	04/15/19 18:08	
Vanadium, Dissolved	ug/L	ND	1.0	04/15/19 18:08	

LABORATORY CONTROL SAMPLE: 3228243

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	107	107	85-115	
Arsenic, Dissolved	ug/L	100	102	102	85-115	
Beryllium, Dissolved	ug/L	100	98.7	99	85-115	
Boron, Dissolved	ug/L	100	97.5	97	85-115	
Cadmium, Dissolved	ug/L	100	110	110	85-115	
Chromium, Dissolved	ug/L	100	106	106	85-115	
Cobalt, Dissolved	ug/L	100	105	105	85-115	
Lead, Dissolved	ug/L	100	109	109	85-115	
Selenium, Dissolved	ug/L	100	104	104	85-115	
Thallium, Dissolved	ug/L	100	105	105	85-115	
Uranium-238, Dissolved	ug/L	100	110	110	85-115	
Vanadium, Dissolved	ug/L	100	106	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3228244 3228245

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10468813002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony, Dissolved	ug/L	ND	100	100	101	102	101	102	70-130	2	20	
Arsenic, Dissolved	ug/L	ND	100	100	98.2	100	98	100	70-130	2	20	
Beryllium, Dissolved	ug/L	ND	100	100	100	99.3	100	99	70-130	1	20	
Boron, Dissolved	ug/L	50.1	100	100	149	149	99	99	70-130	0	20	
Cadmium, Dissolved	ug/L	ND	100	100	98.0	99.7	98	100	70-130	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Parameter	Units	3228244		3228245		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10468813002 Result	MS Spike Conc.	MSD Spike Conc.								
Chromium, Dissolved	ug/L	ND	100	100	99.8	101	100	101	70-130	1	20	
Cobalt, Dissolved	ug/L	ND	100	100	100	103	100	102	70-130	2	20	
Lead, Dissolved	ug/L	ND	100	100	101	104	101	104	70-130	2	20	
Selenium, Dissolved	ug/L	ND	100	100	97.8	99.7	98	100	70-130	2	20	
Thallium, Dissolved	ug/L	ND	100	100	96.7	98.7	97	99	70-130	2	20	
Uranium-238, Dissolved	ug/L	ND	100	100	105	106	105	106	70-130	1	20	
Vanadium, Dissolved	ug/L	ND	100	100	99.8	101	100	101	70-130	1	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468813

QC Batch: 596550 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 3225285 Matrix: Water
Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/01/19 09:59	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/01/19 09:59	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/01/19 09:59	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/01/19 09:59	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/01/19 09:59	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/01/19 09:59	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/01/19 09:59	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/01/19 09:59	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/01/19 09:59	
Decachlorobiphenyl (S)	%	82	30-125	04/01/19 09:59	
Tetrachloro-m-xylene (S)	%	54	30-125	04/01/19 09:59	

LABORATORY CONTROL SAMPLE & LCSD: 3225286

Parameter	Units	3225287								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.7	1.7	85	84	45-125	1	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.8	1.7	90	84	49-125	7	20	
Decachlorobiphenyl (S)	%				91	78	30-125			
Tetrachloro-m-xylene (S)	%				71	58	30-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

QC Batch: 596867 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 3227573 Matrix: Water

Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/03/19 14:02	
2,4-Dichlorophenol	ug/L	ND	10.0	04/03/19 14:02	
2,4-Dimethylphenol	ug/L	ND	10.0	04/03/19 14:02	
2,4-Dinitrophenol	ug/L	ND	10.0	04/03/19 14:02	
2-Chlorophenol	ug/L	ND	10.0	04/03/19 14:02	
2-Methylnaphthalene	ug/L	ND	10.0	04/03/19 14:02	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/03/19 14:02	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/03/19 14:02	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/03/19 14:02	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/03/19 14:02	
Acenaphthene	ug/L	ND	10.0	04/03/19 14:02	
Anthracene	ug/L	ND	10.0	04/03/19 14:02	
Benzo(a)pyrene	ug/L	ND	10.0	04/03/19 14:02	
Benzoic acid	ug/L	ND	50.0	04/03/19 14:02	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/03/19 14:02	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/03/19 14:02	
Butylbenzylphthalate	ug/L	ND	10.0	04/03/19 14:02	
Di-n-butylphthalate	ug/L	ND	10.0	04/03/19 14:02	
Di-n-octylphthalate	ug/L	ND	10.0	04/03/19 14:02	
Diethylphthalate	ug/L	ND	10.0	04/03/19 14:02	
Dimethylphthalate	ug/L	ND	10.0	04/03/19 14:02	
Fluoranthene	ug/L	ND	10.0	04/03/19 14:02	
Fluorene	ug/L	ND	10.0	04/03/19 14:02	
Hexachlorobenzene	ug/L	ND	10.0	04/03/19 14:02	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/03/19 14:02	
Hexachloroethane	ug/L	ND	10.0	04/03/19 14:02	
Isophorone	ug/L	ND	10.0	04/03/19 14:02	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/03/19 14:02	
Pentachlorophenol	ug/L	ND	20.0	04/03/19 14:02	
Phenanthrene	ug/L	ND	10.0	04/03/19 14:02	
Phenol	ug/L	ND	10.0	04/03/19 14:02	
Pyrene	ug/L	ND	10.0	04/03/19 14:02	
2,4,6-Tribromophenol (S)	%	91	52-125	04/03/19 14:02	
2-Fluorobiphenyl (S)	%	71	52-125	04/03/19 14:02	
2-Fluorophenol (S)	%	82	30-125	04/03/19 14:02	
Nitrobenzene-d5 (S)	%	85	55-125	04/03/19 14:02	
p-Terphenyl-d14 (S)	%	91	57-125	04/03/19 14:02	
Phenol-d6 (S)	%	85	30-125	04/03/19 14:02	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

LABORATORY CONTROL SAMPLE & LCSD: 3227574

3227575

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	44.5	44.4	89	89	60-125	0	20	
2,4-Dichlorophenol	ug/L	50	40.6	39.4	81	79	56-125	3	20	
2,4-Dimethylphenol	ug/L	50	33.5	28.5	67	57	33-125	16	20	
2,4-Dinitrophenol	ug/L	50	35.3	36.4	71	73	32-125	3	20	
2-Chlorophenol	ug/L	50	39.1	38.3	78	77	52-125	2	20	
2-Methylnaphthalene	ug/L	50	34.6	39.2	69	78	52-125	13	20	
2-Methylphenol(o-Cresol)	ug/L	50	37.6	36.3	75	73	55-125	4	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	36.9	37.1	74	74	57-125	0	20	
3,3'-Dichlorobenzidine	ug/L	50	41J	36.1J	82	72	39-150		20	
4-Bromophenylphenyl ether	ug/L	50	43.1	46.5	86	93	61-125	8	20	
Acenaphthene	ug/L	50	41.5	44.9	83	90	59-125	8	20	
Anthracene	ug/L	50	43.4	48.2	87	96	64-125	10	20	
Benzo(a)pyrene	ug/L	50	40.5	43.4	81	87	63-125	7	20	
Benzoic acid	ug/L	50	33.5J	31.6J	67	63	30-125		20	1M
bis(2-Chloroethyl) ether	ug/L	50	36.9	36.4	74	73	49-125	1	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	43.2	45.9	86	92	68-125	6	20	
Butylbenzylphthalate	ug/L	50	42.0	45.5	84	91	67-125	8	20	
Di-n-butylphthalate	ug/L	50	45.9	48.3	92	97	67-125	5	20	
Di-n-octylphthalate	ug/L	50	42.8	46.5	86	93	67-125	8	20	
Diethylphthalate	ug/L	50	46.1	44.8	92	90	64-125	3	20	
Dimethylphthalate	ug/L	50	45.7	44.1	91	88	65-125	4	20	
Fluoranthene	ug/L	50	44.1	47.5	88	95	64-125	7	20	
Fluorene	ug/L	50	42.6	45.2	85	90	63-125	6	20	
Hexachlorobenzene	ug/L	50	47.8	50.4	96	101	61-125	5	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	18	17	30-125		20	L2
Hexachloroethane	ug/L	50	19.8	28.9	40	58	30-125	37	20	R1
Isophorone	ug/L	50	41.3	41.3	83	83	59-125	0	20	
N-Nitrosodimethylamine	ug/L	50	37.1	37.2	74	74	43-125	0	20	
Pentachlorophenol	ug/L	50	37.8	40.5	76	81	35-125	7	20	
Phenanthrene	ug/L	50	44.1	47.6	88	95	65-125	8	20	
Phenol	ug/L	50	37.9	38.5	76	77	54-125	1	20	
Pyrene	ug/L	50	41.6	45.1	83	90	65-125	8	20	
2,4,6-Tribromophenol (S)	%				100	95	52-125			
2-Fluorobiphenyl (S)	%				75	80	52-125			
2-Fluorophenol (S)	%				77	76	30-125			
Nitrobenzene-d5 (S)	%				81	81	55-125			
p-Terphenyl-d14 (S)	%				81	88	57-125			
Phenol-d6 (S)	%				76	75	30-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468813

QC Batch: 596900 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 3227643 Matrix: Water
Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/02/19 03:39	

LABORATORY CONTROL SAMPLE: 3227644

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.7	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227645 3227646

Parameter	Units	10468903001 Result	MS		MSD		% Rec	MSD	% Rec	% Rec Limits	Max		Qual
			Spike Conc.	MS Result	MSD Result	RPD					RPD		
Chloride	mg/L	37.2	12.5	42.1	42.2	39	40	90-110	0	20	M1		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3227647 3227648

Parameter	Units	10468903002 Result	MS		MSD		% Rec	MSD	% Rec	% Rec Limits	Max		Qual
			Spike Conc.	MS Result	MSD Result	RPD					RPD		
Chloride	mg/L	48.6	12.5	51.4	51.3	22	21	90-110	0	20	M1		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468813

QC Batch: 596661 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 3226333 Matrix: Water
Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	03/30/19 12:22	FS

LABORATORY CONTROL SAMPLE: 3226334

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.21	105	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3226335 3226336

Parameter	Units	10468813001		3226335		3226336		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Chromium, Hexavalent	mg/L	ND	0.2	0.2	0.20	0.21	96	103	85-115	6	20	FS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10468813

QC Batch: 163940 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 646074 Matrix: Water
Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	04/09/19 12:02	

LABORATORY CONTROL SAMPLE: 646075

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 646076 646077

Parameter	Units	12123225001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	0.15	5	5.4	5	5.3	104	104	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 646078 646079

Parameter	Units	12123229002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Nitrogen, Ammonia	mg/L	ND	5	5.3	5	5.3	105	104	90-110	0	10	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

QC Batch: 598592 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 3236543 Matrix: Water
Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/11/19 09:22	

LABORATORY CONTROL SAMPLE: 3236544

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	247	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3236545 3236546

Parameter	Units	10468606001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	ND	250	251	250	243	100	97	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3236547 3236548

Parameter	Units	10468606002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	ND	250	266	250	246	101	93	80-120	8	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	17.6 ± 4.77 (2.91) C:NA T:NA	pCi/L	04/10/19 09:01	12587-46-1	
Gross Beta		EPA 900.0	6.16 ± 2.22 (2.89) C:NA T:NA	pCi/L	04/10/19 09:01	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	21.4 ± 6.04 (2.89) C:NA T:NA	pCi/L	04/10/19 08:44	12587-46-1	
Gross Beta		EPA 900.0	6.04 ± 2.37 (2.67) C:NA T:NA	pCi/L	04/10/19 08:44	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	3.40 ± 2.24 (2.96) C:NA T:NA	pCi/L	04/10/19 08:34	12587-46-1	
Gross Beta		EPA 900.0	6.62 ± 2.32 (2.88) C:NA T:NA	pCi/L	04/10/19 08:34	12587-47-2	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

QC Batch: 336926

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10468813001, 10468813002, 10468813003

METHOD BLANK: 1639653

Matrix: Water

Associated Lab Samples: 10468813001, 10468813002, 10468813003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.216 ± 0.784 (1.94) C:NA T:NA	pCi/L	04/10/19 08:20	
Gross Beta	0.340 ± 0.855 (1.98) C:NA T:NA	pCi/L	04/10/19 08:20	

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10468813

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 596775

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 597462

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

ANALYTE QUALIFIERS

- 1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
- FS The sample was filtered in the laboratory prior to analysis.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- R1 RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10468813

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10468813001	462521	EPA Mod. 3510C	596550	EPA 8082A	596775
10468813002	M-2	EPA Mod. 3510C	596550	EPA 8082A	596775
10468813003	462522	EPA Mod. 3510C	596550	EPA 8082A	596775
10468813001	462521	EPA 200.7	596975	EPA 200.7	597156
10468813002	M-2	EPA 200.7	596975	EPA 200.7	597156
10468813003	462522	EPA 200.7	596975	EPA 200.7	597156
10468813001	462521	EPA 200.8	596976	EPA 200.8	597743
10468813002	M-2	EPA 200.8	596976	EPA 200.8	597743
10468813003	462522	EPA 200.8	596976	EPA 200.8	597743
10468813001	462521	EPA 3520	596867	EPA 8270D	597462
10468813002	M-2	EPA 3520	596867	EPA 8270D	597462
10468813003	462522	EPA 3520	596867	EPA 8270D	597462
10468813001	462521				
10468813003	462522				
10468813001	462521	EPA 900.0	336926		
10468813002	M-2	EPA 900.0	336926		
10468813003	462522	EPA 900.0	336926		
10468813001	462521	EPA 300.0	596900		
10468813002	M-2	EPA 300.0	596900		
10468813003	462522	EPA 300.0	596900		
10468813001	462521	SM 3500-Cr B Modified	596661		
10468813002	M-2	SM 3500-Cr B Modified	596661		
10468813003	462522	SM 3500-Cr B Modified	596661		
10468813001	462521	EPA 350.1			
10468813003	462522	EPA 350.1			
10468813001	462521	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10468813002	M-2	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10468813003	462522	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10468813001	462521	SM 4500-CN-E	598592	SM 4500-CN-E	598682
10468813002	M-2	SM 4500-CN-E	598592	SM 4500-CN-E	598682
10468813003	462522	SM 4500-CN-E	598592	SM 4500-CN-E	598682

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Minnesota Pollution Control Agency

Chain-of-Custody Form revised 2013.0909

Work Order Number:

COC Type:

Page: / of /

Turnaround Time:

COC ID:

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: MNSW-057

Program Code (MDH Lab Only):

Lab Name: Pace Analytical - Minneapolis, MN

Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters

Project Task Code: PRJ07786

Address: 1700 SE Elm Street

Project Manager: Brad Jacobson

612-607-6375

EPIC PROFILE #: 38716 Line 2

Minneapolis

MN

55414

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wtr-Ground=Groundwater
Wtr-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

PRESERV.

None

HNO3

None

H2SO4

NOOH

None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/ Unionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SVOC, 8082, MDA1, MDA2 - QAPP Table 3a	Lab Sample No.	#
462521	sample	3/29/19	1300			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	001	1
M-2	QC-FR	3/29/19	1305			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	002	2
462522	sample	3/29/19	1350			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	003	3
									N											4
									N											5
									N											6
									N											7
									N											8
									N											9
									N											10

WO#: 10468813



10468813

Sampled By: *David Anderson / Chris Pelasi*

Sampler's Signature: *David Anderson*

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) <i>David Anderson / Pace Analytical</i>	<i>3/29/19 / 1420</i>	<i>Chris Pelasi</i>	<i>3/29/19</i>
		<i>T-56, 6, 1, 15</i>	<i>19:20</i>

Sample Condition Upon Receipt

Client Name: Pace Field Project #: _____

WO# : 10468813
 PM: JMA Due Date: 04/12/19
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Pace SpeedDee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: G87A9155100842 G87A9170600254 Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>5.6, 6.1, 1.5</u> °C	Average Corrected Temp (no temp blank only): <input type="checkbox"/>
Correction Factor: <u>Time</u>	Cooler Temp Corrected w/temp blank: <u>5.6, 6.1, 1.5</u> °C	See Exceptions <input type="checkbox"/>

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: Chad Yonke

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input checked="" type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other _____
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <u>JMA 4/11/19</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: See Exception <input type="checkbox"/>
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other _____	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>i-3</u> <u>1-3</u> <u>1-3</u> <input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate <u>2/2</u> <u>2/2</u> <u>1/1</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input type="checkbox"/> No See Exception <input type="checkbox"/>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No See Exception <input type="checkbox"/>
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): _____
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 04/01/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: [Signature]



Sample Condition Upon Receipt

Client Name: Pace Mpls Project #: _____

WO# : 12123105



Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 111336683 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.3 Cooler Temp Corrected °C: 3.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: Bm 4/2/19

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>W F</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Katie Richards

Date: 4/2/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN
 Cert. Needed: Yes No



Workorder: 10468813 Workorder Name: 19-01567 MPCA Freeway LF 19 WT Owner Received Date: 3/29/2019 Results Requested By: 4/19/2019

Report To		Subcontract To						Requested Analysis													
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600																			
							WO#: 30287095 30287095														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	EMOR BPN	Preserved Containers				Gross Alpha/Beta						LAB USE ONLY				
1	462521	PS	3/29/2019 13:00	10468813001	Water	1															
2	M-2	PS	3/29/2019 13:05	10468813002	Water	1															001
3	462522	PS	3/29/2019 13:50	10468813003	Water	1															002
4																					003
5																					
Transfers											Comments										
Released By	Date/Time	Received By	Date/Time																		
<i>[Signature]</i>	4/1/19 16:00	<i>[Signature]</i>	4/1/19 9:45																		
Cooler Temperature on Receipt - °C				Custody Seal <input checked="" type="checkbox"/> Y or <input checked="" type="checkbox"/> N				Received on Ice Y or <input checked="" type="checkbox"/> N				Samples Intact <input checked="" type="checkbox"/> Y or N									

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace MN

Project # 30287095

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 41038 0195 6549

Label	<u>ET</u>
LIMS Login	<u>ET</u>

Custody Seal on Cooler/Box Present: yes no mg 4/2/19 Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>mg 4/2/19</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>pH < 2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>mg</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>mg</u> Date: <u>4/2/19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



12-Apr-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10468813**

Work Order: **1904100**

Dear Jennifer,

ALS Environmental received 3 samples on 02-Apr-2019 10:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 9.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10468813
Work Order: 1904100

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1904100-01	462521	Water		3/29/2019 13:00	4/2/2019 10:30	<input type="checkbox"/>
1904100-02	M-2	Water		3/29/2019 13:05	4/2/2019 10:30	<input type="checkbox"/>
1904100-03	462522	Water		3/29/2019 13:50	4/2/2019 10:30	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10468813
WorkOrder: 1904100

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468813

Work Order: 1904100

Sample ID: 462521

Lab ID: 1904100-01

Collection Date: 3/29/2019 01:00 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10468813

Work Order: 1904100

Sample ID: M-2

Lab ID: 1904100-02

Collection Date: 3/29/2019 01:05 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE Cyanide, Free	ND		SW9014 20	µg/L	1	Analyst: RZM 4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC
Project: 10468813
Sample ID: 462522
Collection Date: 3/29/2019 01:50 PM

Work Order: 1904100
Lab ID: 1904100-03
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE Cyanide, Free	ND		SW9014 20	µg/L	1	Analyst: RZM 4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 1904100
Project: 10468813

QC BATCH REPORT

Batch ID: **R258103** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R258103-R258103				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596554		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	ND	20								

LCS		Sample ID: LCS-R258103-R258103				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596555		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	264.9	20	250	0	106	81-119	0			

MS		Sample ID: 1904010-01A MS				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596560		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	264.9	20	250	-6.48	109	81-119	0			

MSD		Sample ID: 1904010-01A MSD				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596561		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	247.2	20	250	-6.48	101	81-119	264.9	6.91	20	

The following samples were analyzed in this batch: 1904100-01A 1904100-02A 1904100-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **02-Apr-19 10:30**

Work Order: **1904100**

Received by: **BNF**

Checklist completed by *Lernina France* 02-Apr-19
eSignature Date

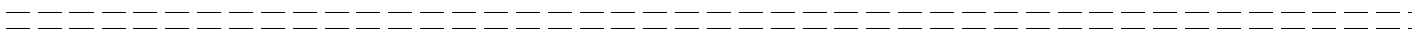
Reviewed by: *Chad Whilton* 02-Apr-19
eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<input type="text" value="3.6/3.6 C"/>		<input type="text" value="SR2"/>
Cooler(s)/Kit(s):	<input type="text" value="1"/>		
Date/Time sample(s) sent to storage:	<input type="text" value="4/2/2019 1:11:18 PM"/>		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<input type="text"/>		

Login Notes:



Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 16, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/02/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAP Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2019
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468813
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
462521	A191402-01	Water	03/29/2019	04/02/2019
M-2	A191402-02	Water	03/29/2019	04/02/2019
462522	A191402-03	Water	03/29/2019	04/02/2019

CASE NARRATIVE

Sample Receipt Information:

3 samples were received on 04/02/2019. Samples were received at 1.8 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The E1 footnote on samples A191402-01 through A191402-03 indicates that there were quality control sample exceedances for terbufos. The LCS recovery was below acceptable limits. Please see the quality control section of the report for more information.

The LCS and LCS duplicate recoveries indicate a potential high bias for ethalfluralin, fonofos, propachlor and triallate for samples A191402-01 through A191402-03. Samples were less than the reporting limit for these analytes so no further action is required.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for cyanazine, ethalfluralin, pendimethalin and trifluralin for samples A191402-01 through A191402-03. Samples were less than the reporting limit for these analytes so no further action is required.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468813
Project Manager: Jennifer Anderson

462521

Date Sampled

A191402-01 (Water)

03/29/2019 13:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:35	EPA 8270D	
Surrogate: Atrazine-d5		89.8 %		56.9-123	04/04/2019	04/09/2019 12:35	EPA 8270D	
Surrogate: Parathion-d10		1630 %		23.8-169	04/04/2019	04/09/2019 12:35	EPA 8270D	S
Surrogate: Triphenyl phosphate		101 %		50.5-178	04/04/2019	04/09/2019 12:35	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 09:30	EPA 8151A	
Surrogate: 2,4-D-d5		82.8 %		44.2-121	04/03/2019	04/07/2019 09:30	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468813
Project Manager: Jennifer Anderson

M-2
A191402-02 (Water)

Date Sampled
03/29/2019 13:05

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:03	EPA 8270D	
Surrogate: Atrazine-d5		83.7 %		56.9-123	04/04/2019	04/09/2019 13:03	EPA 8270D	
Surrogate: Parathion-d10		202 %		23.8-169	04/04/2019	04/09/2019 13:03	EPA 8270D	S
Surrogate: Triphenyl phosphate		91.0 %		50.5-178	04/04/2019	04/09/2019 13:03	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:06	EPA 8151A	
Surrogate: 2,4-D-d5		73.8 %		44.2-121	04/03/2019	04/07/2019 10:06	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468813
Project Manager: Jennifer Anderson

462522

Date Sampled

A191402-03 (Water)

03/29/2019 13:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 13:31	EPA 8270D	
Surrogate: Atrazine-d5		85.3 %		56.9-123	04/04/2019	04/09/2019 13:31	EPA 8270D	
Surrogate: Parathion-d10		185 %		23.8-169	04/04/2019	04/09/2019 13:31	EPA 8270D	S
Surrogate: Triphenyl phosphate		98.7 %		50.5-178	04/04/2019	04/09/2019 13:31	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904142

2,4-D	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/03/2019	04/07/2019 10:41	EPA 8151A	
Surrogate: 2,4-D-d5		74.3 %		44.2-121	04/03/2019	04/07/2019 10:41	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468813
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904147 - EPA 3510C

Blank (A904147-BLK1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:08

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>0.511</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>1.07</i>		<i>ug/L</i>	<i>0.5000</i>		<i>215</i>	<i>23.8-169</i>			<i>S</i>
<i>Surrogate: Triphenyl phosphate</i>	<i>0.453</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.6</i>	<i>50.5-178</i>			

LCS (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:36

Acetochlor	0.817	0.50	ug/L	1.000		81.7	67.8-122			
Alachlor	0.819	0.50	ug/L	1.000		81.9	68.6-119			
Atrazine	0.802	0.50	ug/L	1.000		80.2	68.6-115			
Chlorpyrifos	0.841	0.50	ug/L	1.000		84.1	63.1-120			
Cyanazine	0.832	0.20	ug/L	1.000		83.2	55.3-143			
Desethylatrazine	0.766	0.50	ug/L	1.000		76.6	67.8-115			
Deisopropylatrazine	0.594	0.50	ug/L	1.000		59.4	50.1-100			
Dimethenamid	0.795	0.50	ug/L	1.000		79.5	70.3-121			
EPTC	0.649	0.50	ug/L	1.000		64.9	50.4-101			
Ethalfuralin	1.87	0.50	ug/L	1.000		187	42.6-121			
Fonofos	1.62	0.50	ug/L	1.000		162	56.6-119			
Metolachlor	0.822	0.50	ug/L	1.000		82.2	71.3-128			
Metribuzin	0.760	0.50	ug/L	1.000		76.0	64.9-120			
Pendimethalin	0.841	0.50	ug/L	1.000		84.1	60.9-128			
Phorate	0.477	0.30	ug/L	1.000		47.7	37.3-112			
Prometon	0.799	0.50	ug/L	1.000		79.9	67.1-120			
Propachlor	1.92	0.50	ug/L	1.000		192	66.2-127			
Propazine	0.800	0.50	ug/L	1.000		80.0	68.2-118			
Simazine	0.800	0.50	ug/L	1.000		80.0	67.2-117			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468813
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904147 - EPA 3510C

LCS (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:36

Terbufos	0.283	0.20	ug/L	1.000		28.3	34.3-111			
Triallate	1.82	0.50	ug/L	1.000		182	53-121			
Trifluralin	0.759	0.50	ug/L	1.000		75.9	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.447</i>		<i>ug/L</i>	<i>0.5000</i>		<i>89.4</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.952</i>		<i>ug/L</i>	<i>0.5000</i>		<i>190</i>	<i>23.8-169</i>			S
<i>Surrogate: Triphenyl phosphate</i>	<i>0.418</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.5</i>	<i>50.5-178</i>			

LCS Dup (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 19:04

Acetochlor	0.885	0.50	ug/L	1.000		88.5	67.8-122	7.93	20	
Alachlor	0.867	0.50	ug/L	1.000		86.7	68.6-119	5.69	20	
Atrazine	0.846	0.50	ug/L	1.000		84.6	68.6-115	5.34	20	
Chlorpyrifos	0.897	0.50	ug/L	1.000		89.7	63.1-120	6.43	20	
Cyanazine	0.904	0.20	ug/L	1.000		90.4	55.3-143	8.21	20	
Desethylatrazine	0.822	0.50	ug/L	1.000		82.2	67.8-115	7.00	20	
Deisopropylatrazine	0.616	0.50	ug/L	1.000		61.6	50.1-100	3.55	20	
Dimethenamid	0.855	0.50	ug/L	1.000		85.5	70.3-121	7.20	20	
EPTC	0.742	0.50	ug/L	1.000		74.2	50.4-101	13.3	20	
Ethalfuralin	1.47	0.50	ug/L	1.000		147	42.6-121	24.0	20	X
Fonofos	1.35	0.50	ug/L	1.000		135	56.6-119	17.8	20	
Metolachlor	0.886	0.50	ug/L	1.000		88.6	71.3-128	7.43	20	
Metribuzin	0.789	0.50	ug/L	1.000		78.9	64.9-120	3.69	20	
Pendimethalin	0.888	0.50	ug/L	1.000		88.8	60.9-128	5.41	20	
Phorate	0.541	0.30	ug/L	1.000		54.1	37.3-112	12.7	20	
Prometon	0.831	0.50	ug/L	1.000		83.1	67.1-120	3.92	20	
Propachlor	1.63	0.50	ug/L	1.000		163	66.2-127	16.7	20	
Propazine	0.874	0.50	ug/L	1.000		87.4	68.2-118	8.91	20	
Simazine	0.883	0.50	ug/L	1.000		88.3	67.2-117	9.75	20	
Terbufos	0.366	0.20	ug/L	1.000		36.6	34.3-111	25.7	20	X
Triallate	1.57	0.50	ug/L	1.000		157	53-121	14.6	20	
Trifluralin	0.805	0.50	ug/L	1.000		80.5	45.9-116	5.95	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.478</i>		<i>ug/L</i>	<i>0.5000</i>		<i>95.7</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.842</i>		<i>ug/L</i>	<i>0.5000</i>		<i>168</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.410</i>		<i>ug/L</i>	<i>0.5000</i>		<i>82.1</i>	<i>50.5-178</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468813
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904142 - EPA 3510C

Blank (A904142-BLK1)

Prepared: 04/03/2019 Analyzed: 04/06/2019 23:26

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
Surrogate: 2,4-D-d5	1.51		ug/L	2.006		75.1	44.2-121			

LCS (A904142-BS1)

Prepared: 04/03/2019 Analyzed: 04/07/2019 00:01

2,4-D	1.90	0.50	ug/L	2.000		95.1	64.6-148			
2,4-DB	1.80	0.50	ug/L	2.000		89.9	66.7-143			
2,4,5-T	1.80	0.50	ug/L	2.000		90.1	63.4-133			
2,4,5-TP (Silvex)	1.68	0.50	ug/L	2.000		84.1	63-145			
Bentazon	0.679	0.50	ug/L	1.000		67.9	52.5-139			
Dicamba	1.61	0.50	ug/L	2.000		80.6	55.4-143			
MCPA	1.45	0.30	ug/L	2.000		72.4	33.5-143			
Picloram	0.740	0.50	ug/L	1.000		74.0	47.9-113			
Triclopyr	1.62	0.50	ug/L	2.000		80.9	65.1-141			
Surrogate: 2,4-D-d5	1.60		ug/L	2.006		79.6	44.2-121			

LCS Dup (A904142-BSD1)

Prepared: 04/03/2019 Analyzed: 04/07/2019 00:37

2,4-D	1.73	0.50	ug/L	2.000		86.4	64.6-148	9.56	20	
2,4-DB	1.63	0.50	ug/L	2.000		81.6	66.7-143	9.67	20	
2,4,5-T	1.67	0.50	ug/L	2.000		83.5	63.4-133	7.57	20	
2,4,5-TP (Silvex)	1.59	0.50	ug/L	2.000		79.3	63-145	5.92	20	
Bentazon	0.656	0.50	ug/L	1.000		65.6	52.5-139	3.52	20	
Dicamba	1.64	0.50	ug/L	2.000		81.8	55.4-143	1.47	20	
MCPA	1.45	0.30	ug/L	2.000		72.4	33.5-143	0.0138	20	
Picloram	0.714	0.50	ug/L	1.000		71.4	47.9-113	3.60	20	
Triclopyr	1.56	0.50	ug/L	2.000		77.9	65.1-141	3.79	20	
Surrogate: 2,4-D-d5	1.47		ug/L	2.006		73.2	44.2-121			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10468813
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- E1 Estimated value because of quality control sample exceedances.
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A191402



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Owner Received Date: 3/29/2019 Results Requested By: 4/19/2019

Workorder: 10468813 Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Report To		Subcontract To				Requested Analysis																
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix															Unpreserved AGIU	Preserved Containers	
1	462521	PS	3/29/2019 13:00	10468813001	Water	4												X	X		01	
2	M-2	PS	3/29/2019 13:05	10468813002	Water	4												X	X		02	
3	462522	PS	3/29/2019 13:50	10468813003	Water	4												X	X		03	
4																						
5																						

Transfers					Comments	
Released By	Date/Time	Received By	Date/Time			
<i>[Signature]</i>	4/1/19 1505	<i>Kari-A-Phillips</i>	4/2/19 1015			Need MPCA Equis EDD and Barr Equis 5 EDD

Cooler Temperature on Receipt 1.6 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 LTD 7/13/19

April 18, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 01, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification UST-107
Montana Certificate #CERT0103
Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683

Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10469117001	813740	Water	04/01/19 10:10	04/01/19 16:25
10469117002	813764	Water	04/01/19 10:50	04/01/19 16:25
10469117003	813761	Water	04/01/19 13:00	04/01/19 16:25
10469117004	240816	Water	04/01/19 15:10	04/01/19 16:25

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10469117001	813740	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10469117002	813764	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10469117003	813761	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10469117004	240816	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 813740		Lab ID: 10469117001		Collected: 04/01/19 10:10	Received: 04/01/19 16:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.095	1	04/02/19 13:33	04/03/19 09:05	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	55	%	30-125	1	04/02/19 13:33	04/03/19 09:05	877-09-8	
Decachlorobiphenyl (S)	41	%	30-125	1	04/02/19 13:33	04/03/19 09:05	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/03/19 14:21	04/08/19 16:23	7429-90-5	
Barium, Dissolved	703	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:23	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:23	7440-50-8	
Manganese, Dissolved	101	ug/L	5.0	1	04/03/19 14:21	04/08/19 16:23	7439-96-5	
Nickel, Dissolved	34.3	ug/L	20.0	1	04/03/19 14:21	04/08/19 16:23	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:23	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/03/19 14:21	04/08/19 16:23	7440-31-5	
Total Hardness by 2340B, Dissolved	683000	ug/L	3300	1	04/03/19 14:21	04/08/19 16:23		
Zinc, Dissolved	ND	ug/L	20.0	1	04/03/19 14:21	04/08/19 16:23	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:19	7440-36-0	
Arsenic, Dissolved	10.9	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:19	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/03/19 14:21	04/11/19 02:19	7440-41-7	
Boron, Dissolved	1220	ug/L	100	10	04/03/19 14:21	04/11/19 15:45	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/03/19 14:21	04/11/19 02:19	7440-43-9	
Chromium, Dissolved	4.2	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:19	7440-47-3	
Cobalt, Dissolved	10.9	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:19	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/03/19 14:21	04/11/19 02:19	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:19	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/03/19 14:21	04/11/19 02:19	7440-28-0	
Uranium-238, Dissolved	0.90	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:19	7440-61-1	
Vanadium, Dissolved	1.6	ug/L	1.0	1	04/03/19 14:21	04/11/19 02:19	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	83-32-9	
Anthracene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	50-32-8	
Benzoic acid	ND	ug/L	49.5	1	04/02/19 17:26	04/04/19 13:56	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 813740 **Lab ID: 10469117001** Collected: 04/01/19 10:10 Received: 04/01/19 16:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
------------	---------	-------	--------------	----	----------	----------	---------	------

8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.5	1	04/02/19 17:26	04/04/19 13:56	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	120-83-2	
Diethylphthalate	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	105-67-9	
Dimethylphthalate	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	117-81-7	
Fluoranthene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	206-44-0	
Fluorene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	86-73-7	
Hexachlorobenzene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.5	1	04/02/19 17:26	04/04/19 13:56	77-47-4	
Hexachloroethane	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	67-72-1	
Isophorone	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.8	1	04/02/19 17:26	04/04/19 13:56		
N-Nitrosodimethylamine	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	62-75-9	
Pentachlorophenol	ND	ug/L	19.8	1	04/02/19 17:26	04/04/19 13:56	87-86-5	
Phenanthrene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	85-01-8	
Phenol	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	108-95-2	
Pyrene	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.9	1	04/02/19 17:26	04/04/19 13:56	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	109	%.	55-125	1	04/02/19 17:26	04/04/19 13:56	4165-60-0	
2-Fluorobiphenyl (S)	98	%.	52-125	1	04/02/19 17:26	04/04/19 13:56	321-60-8	
p-Terphenyl-d14 (S)	109	%.	57-125	1	04/02/19 17:26	04/04/19 13:56	1718-51-0	
Phenol-d6 (S)	98	%.	30-125	1	04/02/19 17:26	04/04/19 13:56	13127-88-3	
2-Fluorophenol (S)	92	%.	30-125	1	04/02/19 17:26	04/04/19 13:56	367-12-4	
2,4,6-Tribromophenol (S)	125	%.	52-125	1	04/02/19 17:26	04/04/19 13:56	118-79-6	

Field Data

Analytical Method:

Well Locked	Yes			1		04/01/19 10:10		
Purge Method	Grundfos Redi-Flo			1		04/01/19 10:10		
Total Well Depth	66.35	feet		1		04/01/19 10:10		
Depth of Water	55.90			1		04/01/19 10:10		
Well Volume Purged	5.1			1		04/01/19 10:10		
Purge Rate	0.1			1		04/01/19 10:10		
Collected Date	04/01/19			1		04/01/19 10:10		
Collected Time	1010			1		04/01/19 10:10		
Field pH	6.9	Std. Units		1		04/01/19 10:10		
Field Temperature	12.5	deg C		1		04/01/19 10:10		
Field Specific Conductance	4440	umhos/cm		1		04/01/19 10:10		
Oxygen, Dissolved	0.9	mg/L		1		04/01/19 10:10	7782-44-7	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 813740	Lab ID: 10469117001	Collected: 04/01/19 10:10	Received: 04/01/19 16:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
REDOX	-91	mV		1		04/01/19 10:10		
Turbidity	47.3	NTU		1		04/01/19 10:10		
Apparent Color	Slightly Cloudy			1		04/01/19 10:10		
Odor	No			1		04/01/19 10:10		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	501	mg/L	12.0	10		04/04/19 15:19	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		04/02/19 09:31		FS
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.15	mg/L	0.010	1		04/11/19 14:34		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	84.9	mg/L	1.1	10	04/09/19 08:29	04/09/19 13:03	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 10:48	57-12-5	

Sample: 813764	Lab ID: 10469117002	Collected: 04/01/19 10:50	Received: 04/01/19 16:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.								
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	04/02/19 13:33	04/03/19 09:21	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	46	%	30-125	1	04/02/19 13:33	04/03/19 09:21	877-09-8	
Decachlorobiphenyl (S)	35	%	30-125	1	04/02/19 13:33	04/03/19 09:21	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/03/19 14:21	04/08/19 16:34	7429-90-5	
Barium, Dissolved	587	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:34	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:34	7440-50-8	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 813764 **Lab ID: 10469117002** Collected: 04/01/19 10:50 Received: 04/01/19 16:25 Matrix: Water

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Manganese, Dissolved	289	ug/L	5.0	1	04/03/19 14:21	04/08/19 16:34	7439-96-5	
Nickel, Dissolved	38.1	ug/L	20.0	1	04/03/19 14:21	04/08/19 16:34	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:34	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/03/19 14:21	04/08/19 16:34	7440-31-5	
Total Hardness by 2340B, Dissolved	1470000	ug/L	3300	1	04/03/19 14:21	04/08/19 16:34		
Zinc, Dissolved	ND	ug/L	20.0	1	04/03/19 14:21	04/08/19 16:34	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	0.59	ug/L	0.50	1	04/03/19 14:21	04/11/19 10:49	7440-36-0	
Arsenic, Dissolved	3.8	ug/L	0.50	1	04/03/19 14:21	04/11/19 10:49	7440-38-2	
Beryllium, Dissolved	ND	ug/L	1.0	5	04/03/19 14:21	04/11/19 00:15	7440-41-7	D3
Boron, Dissolved	2820	ug/L	500	50	04/03/19 14:21	04/11/19 15:32	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/03/19 14:21	04/11/19 10:49	7440-43-9	
Chromium, Dissolved	8.8	ug/L	2.5	5	04/03/19 14:21	04/11/19 00:15	7440-47-3	
Cobalt, Dissolved	42.6	ug/L	0.50	1	04/03/19 14:21	04/11/19 10:49	7440-48-4	
Lead, Dissolved	0.15	ug/L	0.10	1	04/03/19 14:21	04/11/19 10:49	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/03/19 14:21	04/11/19 10:49	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/03/19 14:21	04/11/19 10:49	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/03/19 14:21	04/11/19 10:49	7440-61-1	
Vanadium, Dissolved	ND	ug/L	5.0	5	04/03/19 14:21	04/11/19 00:15	7440-62-2	D3
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	83-32-9	
Anthracene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	120-12-7	
Benzo(a)pyrene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	50-32-8	
Benzoic acid	ND	ug/L	105	2	04/02/19 17:26	04/04/19 13:27	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	101-55-3	
Butylbenzylphthalate	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	111-44-4	
2-Chlorophenol	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	105	2	04/02/19 17:26	04/04/19 13:27	91-94-1	
2,4-Dichlorophenol	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	120-83-2	
Diethylphthalate	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	84-66-2	
2,4-Dimethylphenol	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	105-67-9	
Dimethylphthalate	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	131-11-3	
Di-n-butylphthalate	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	84-74-2	
2,4-Dinitrophenol	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	51-28-5	
Di-n-octylphthalate	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	117-81-7	
Fluoranthene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	206-44-0	
Fluorene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	86-73-7	
Hexachlorobenzene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	105	2	04/02/19 17:26	04/04/19 13:27	77-47-4	
Hexachloroethane	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	67-72-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Sample Project No.: 10469117

Sample: 813764 **Lab ID: 10469117002** Collected: 04/01/19 10:50 Received: 04/01/19 16:25 Matrix: Water

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV Analytical Method: EPA 8270D Preparation Method: EPA 3520

Isophorone	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	78-59-1	
2-Methylnaphthalene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	42.1	2	04/02/19 17:26	04/04/19 13:27		
N-Nitrosodimethylamine	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	62-75-9	
Pentachlorophenol	ND	ug/L	42.1	2	04/02/19 17:26	04/04/19 13:27	87-86-5	
Phenanthrene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	85-01-8	
Phenol	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	108-95-2	
Pyrene	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	21.1	2	04/02/19 17:26	04/04/19 13:27	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	102	%	55-125	2	04/02/19 17:26	04/04/19 13:27	4165-60-0	D3
2-Fluorobiphenyl (S)	95	%	52-125	2	04/02/19 17:26	04/04/19 13:27	321-60-8	
p-Terphenyl-d14 (S)	101	%	57-125	2	04/02/19 17:26	04/04/19 13:27	1718-51-0	
Phenol-d6 (S)	92	%	30-125	2	04/02/19 17:26	04/04/19 13:27	13127-88-3	
2-Fluorophenol (S)	87	%	30-125	2	04/02/19 17:26	04/04/19 13:27	367-12-4	
2,4,6-Tribromophenol (S)	118	%	52-125	2	04/02/19 17:26	04/04/19 13:27	118-79-6	

Field Data Analytical Method:

Well Locked	Yes			1		04/01/19 10:50		
Purge Method	Grundfos Redi-Flo			1		04/01/19 10:50		
Total Well Depth	50.43	feet		1		04/01/19 10:50		
Depth of Water	46.38			1		04/01/19 10:50		
Well Volume Purged	2.1			1		04/01/19 10:50		
Purge Rate	0.1			1		04/01/19 10:50		
Collected Date	04/01/19			1		04/01/19 10:50		
Collected Time	1050			1		04/01/19 10:50		
Field pH	6.9	Std. Units		1		04/01/19 10:50		
Field Temperature	12.5	deg C		1		04/01/19 10:50		
Field Specific Conductance	7290	umhos/cm		1		04/01/19 10:50		
Oxygen, Dissolved	0.8	mg/L		1		04/01/19 10:50	7782-44-7	
REDOX	-118	mV		1		04/01/19 10:50		
Turbidity	107	NTU		1		04/01/19 10:50		
Apparent Color	Slightly Cloudy			1		04/01/19 10:50		
Odor	No			1		04/01/19 10:50		

300.0 IC Anions Analytical Method: EPA 300.0

Chloride	1070	mg/L	24.0	20		04/04/19 15:37	16887-00-6	
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Chromium, Hexavalent Analytical Method: SM 3500-Cr B Modified

Chromium, Hexavalent	ND	mg/L	0.010	1		04/02/19 10:20		FS
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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 813764 **Lab ID: 10469117002** Collected: 04/01/19 10:50 Received: 04/01/19 16:25 Matrix: Water

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Unionized Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/11/19 14:35		
350.1 Ammonia, Distilled Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	ND	mg/L	0.11	1	04/09/19 08:29	04/09/19 12:11	7664-41-7	
SM4500CN-E Cyanide Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 10:49	57-12-5	

Sample: 813761 **Lab ID: 10469117003** Collected: 04/01/19 13:00 Received: 04/01/19 16:25 Matrix: Water

Comments: • Upon receipt at the laboratory, 10 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis. Sample would not preserve to a pH <2.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	1.0	1	04/02/19 13:33	04/03/19 09:36	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	88	%	30-125	1	04/02/19 13:33	04/03/19 09:36	877-09-8	
Decachlorobiphenyl (S)	45	%	30-125	1	04/02/19 13:33	04/03/19 09:36	2051-24-3	

200.7 MET ICP, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7

Aluminum, Dissolved	2050	ug/L	200	1	04/03/19 14:21	04/08/19 16:36	7429-90-5	
Barium, Dissolved	87.8	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:36	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:36	7440-50-8	
Manganese, Dissolved	35700	ug/L	25.0	5	04/03/19 14:21	04/08/19 17:37	7439-96-5	
Nickel, Dissolved	1730	ug/L	20.0	1	04/03/19 14:21	04/08/19 16:36	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:36	7440-22-4	
Tin, Dissolved	78.5	ug/L	75.0	1	04/03/19 14:21	04/08/19 16:36	7440-31-5	
Total Hardness by 2340B, Dissolved	6930000	ug/L	16500	5	04/03/19 14:21	04/08/19 17:37		
Zinc, Dissolved	64300	ug/L	100	5	04/03/19 14:21	04/08/19 17:37	7440-66-6	

200.8 MET ICPMS, Dissolved Analytical Method: EPA 200.8 Preparation Method: EPA 200.8

Antimony, Dissolved	15.8	ug/L	2.5	5	04/03/19 14:21	04/11/19 00:19	7440-36-0	
Arsenic, Dissolved	11.4	ug/L	2.5	5	04/03/19 14:21	04/11/19 00:19	7440-38-2	
Beryllium, Dissolved	ND	ug/L	1.0	5	04/03/19 14:21	04/11/19 00:19	7440-41-7	D3

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 813761 **Lab ID: 10469117003** Collected: 04/01/19 13:00 Received: 04/01/19 16:25 Matrix: Water

Comments: • Upon receipt at the laboratory, 10 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis. Sample would not preserve to a pH <2.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Boron, Dissolved	14800	ug/L	1000	100	04/03/19 14:21	04/11/19 15:36	7440-42-8	
Cadmium, Dissolved	5.4	ug/L	0.40	5	04/03/19 14:21	04/11/19 00:19	7440-43-9	
Chromium, Dissolved	74.6	ug/L	2.5	5	04/03/19 14:21	04/11/19 00:19	7440-47-3	
Cobalt, Dissolved	347	ug/L	2.5	5	04/03/19 14:21	04/11/19 00:19	7440-48-4	
Lead, Dissolved	33.9	ug/L	0.50	5	04/03/19 14:21	04/11/19 00:19	7439-92-1	
Selenium, Dissolved	ND	ug/L	2.5	5	04/03/19 14:21	04/11/19 00:19	7782-49-2	D3
Thallium, Dissolved	ND	ug/L	0.50	5	04/03/19 14:21	04/11/19 00:19	7440-28-0	D3
Uranium-238, Dissolved	ND	ug/L	2.5	5	04/03/19 14:21	04/11/19 00:19	7440-61-1	D3
Vanadium, Dissolved	6.0	ug/L	5.0	5	04/03/19 14:21	04/11/19 00:19	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	83-32-9	
Anthracene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	120-12-7	
Benzo(a)pyrene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	50-32-8	
Benzoic acid	ND	ug/L	2500	1	04/02/19 17:26	04/04/19 12:59	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	101-55-3	
Butylbenzylphthalate	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	111-44-4	
2-Chlorophenol	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	2500	1	04/02/19 17:26	04/04/19 12:59	91-94-1	
2,4-Dichlorophenol	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	120-83-2	
Diethylphthalate	1300	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	84-66-2	
2,4-Dimethylphenol	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	105-67-9	
Dimethylphthalate	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	131-11-3	
Di-n-butylphthalate	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	84-74-2	
2,4-Dinitrophenol	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	51-28-5	
Di-n-octylphthalate	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	117-81-7	
Fluoranthene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	206-44-0	
Fluorene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	86-73-7	
Hexachlorobenzene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	2500	1	04/02/19 17:26	04/04/19 12:59	77-47-4	
Hexachloroethane	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	67-72-1	
Isophorone	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	78-59-1	
2-Methylnaphthalene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	1000	1	04/02/19 17:26	04/04/19 12:59		
N-Nitrosodimethylamine	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	62-75-9	
Pentachlorophenol	ND	ug/L	1000	1	04/02/19 17:26	04/04/19 12:59	87-86-5	
Phenanthrene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	85-01-8	
Phenol	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	108-95-2	
Pyrene	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	500	1	04/02/19 17:26	04/04/19 12:59	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	107	%	55-125	1	04/02/19 17:26	04/04/19 12:59	4165-60-0	P3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 813761 **Lab ID: 10469117003** Collected: 04/01/19 13:00 Received: 04/01/19 16:25 Matrix: Water

Comments: • Upon receipt at the laboratory, 10 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis. Sample would not preserve to a pH <2.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

Surrogates

2-Fluorobiphenyl (S)	82	%	52-125	1	04/02/19 17:26	04/04/19 12:59	321-60-8	
p-Terphenyl-d14 (S)	89	%	57-125	1	04/02/19 17:26	04/04/19 12:59	1718-51-0	
Phenol-d6 (S)	64	%	30-125	1	04/02/19 17:26	04/04/19 12:59	13127-88-3	
2-Fluorophenol (S)	10	%	30-125	1	04/02/19 17:26	04/04/19 12:59	367-12-4	S5
2,4,6-Tribromophenol (S)	97	%	52-125	1	04/02/19 17:26	04/04/19 12:59	118-79-6	

Field Data

Analytical Method:

Collected Date	04/01/19			1		04/01/19 13:00		
Collected Time	1300			1		04/01/19 13:00		
Field pH	5.7	Std. Units		1		04/01/19 13:00		
Field Temperature	11.0	deg C		1		04/01/19 13:00		
Field Specific Conductance	18100	umhos/cm		1		04/01/19 13:00		
Oxygen, Dissolved	0.9	mg/L		1		04/01/19 13:00	7782-44-7	
REDOX	-28	mV		1		04/01/19 13:00		
Turbidity	440	NTU		1		04/01/19 13:00		
Apparent Color	Cloudy w/Particulate			1		04/01/19 13:00		
Odor	Leachate Odor			1		04/01/19 13:00		
Well Locked	Yes			1		04/01/19 13:00		
Purge Method	Disposable Bailer			1		04/01/19 13:00		
Total Well Depth	40.03	feet		1		04/01/19 13:00		
Depth of Water	36.62			1		04/01/19 13:00		
Well Volume Purged	1.8			1		04/01/19 13:00		
Purge Rate	NA			1		04/01/19 13:00		

300.0 IC Anions

Analytical Method: EPA 300.0

Chloride	1240	mg/L	60.0	50		04/04/19 15:54	16887-00-6	
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Chromium, Hexavalent

Analytical Method: SM 3500-Cr B Modified

Chromium, Hexavalent	0.12	mg/L	0.020	2		04/02/19 15:48		FS,H5
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350.1 Ammonia, Unionized

Analytical Method: EPA 350.1

Nitrogen, Ammonia (Unionized)	0.062	mg/L	0.010	1		04/11/19 14:36		
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350.1 Ammonia, Distilled

Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)

Nitrogen, Ammonia	621	mg/L	11.0	5	04/09/19 08:29	04/09/19 12:49	7664-41-7	
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SM4500CN-E Cyanide

Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E

Cyanide	ND	ug/L	20.0	1	04/10/19 09:16	04/11/19 10:49	57-12-5	
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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 240816		Lab ID: 10469117004		Collected: 04/01/19 15:10	Received: 04/01/19 16:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	04/02/19 13:33	04/03/19 09:51	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	56	%	30-125	1	04/02/19 13:33	04/03/19 09:51	877-09-8	
Decachlorobiphenyl (S)	62	%	30-125	1	04/02/19 13:33	04/03/19 09:51	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/03/19 14:21	04/08/19 16:37	7429-90-5	
Barium, Dissolved	146	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:37	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:37	7440-50-8	
Manganese, Dissolved	1240	ug/L	5.0	1	04/03/19 14:21	04/08/19 16:37	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/03/19 14:21	04/08/19 16:37	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/03/19 14:21	04/08/19 16:37	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/03/19 14:21	04/08/19 16:37	7440-31-5	
Total Hardness by 2340B, Dissolved	602000	ug/L	3300	1	04/03/19 14:21	04/08/19 16:37		
Zinc, Dissolved	ND	ug/L	20.0	1	04/03/19 14:21	04/08/19 16:37	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:23	7440-36-0	
Arsenic, Dissolved	3.0	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:23	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/03/19 14:21	04/11/19 02:23	7440-41-7	
Boron, Dissolved	377	ug/L	50.0	5	04/03/19 14:21	04/11/19 15:40	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/03/19 14:21	04/11/19 02:23	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:23	7440-47-3	
Cobalt, Dissolved	4.4	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:23	7440-48-4	
Lead, Dissolved	0.11	ug/L	0.10	1	04/03/19 14:21	04/11/19 02:23	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:23	7782-49-2	
Thallium, Dissolved	0.18	ug/L	0.10	1	04/03/19 14:21	04/11/19 02:23	7440-28-0	
Uranium-238, Dissolved	3.3	ug/L	0.50	1	04/03/19 14:21	04/11/19 02:23	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/03/19 14:21	04/11/19 02:23	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	83-32-9	
Anthracene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	50-32-8	
Benzoic acid	ND	ug/L	47.4	1	04/02/19 17:26	04/04/19 14:24	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 240816 **Lab ID: 10469117004** Collected: 04/01/19 15:10 Received: 04/01/19 16:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	47.4	1	04/02/19 17:26	04/04/19 14:24	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	120-83-2	
Diethylphthalate	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	105-67-9	
Dimethylphthalate	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	117-81-7	
Fluoranthene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	206-44-0	
Fluorene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	86-73-7	
Hexachlorobenzene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	47.4	1	04/02/19 17:26	04/04/19 14:24	77-47-4	
Hexachloroethane	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	67-72-1	
Isophorone	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.0	1	04/02/19 17:26	04/04/19 14:24		
N-Nitrosodimethylamine	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	62-75-9	
Pentachlorophenol	ND	ug/L	19.0	1	04/02/19 17:26	04/04/19 14:24	87-86-5	
Phenanthrene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	85-01-8	
Phenol	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	108-95-2	
Pyrene	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.5	1	04/02/19 17:26	04/04/19 14:24	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	78	%	55-125	1	04/02/19 17:26	04/04/19 14:24	4165-60-0	
2-Fluorobiphenyl (S)	79	%	52-125	1	04/02/19 17:26	04/04/19 14:24	321-60-8	
p-Terphenyl-d14 (S)	98	%	57-125	1	04/02/19 17:26	04/04/19 14:24	1718-51-0	
Phenol-d6 (S)	74	%	30-125	1	04/02/19 17:26	04/04/19 14:24	13127-88-3	
2-Fluorophenol (S)	65	%	30-125	1	04/02/19 17:26	04/04/19 14:24	367-12-4	
2,4,6-Tribromophenol (S)	107	%	52-125	1	04/02/19 17:26	04/04/19 14:24	118-79-6	

Field Data

Analytical Method:

Collected Date	04/01/19			1		04/01/19 15:10		
Collected Time	1510			1		04/01/19 15:10		
Field pH	6.9	Std. Units		1		04/01/19 15:10		
Field Temperature	8.5	deg C		1		04/01/19 15:10		
Field Specific Conductance	1730	umhos/cm		1		04/01/19 15:10		
Oxygen, Dissolved	0.3	mg/L		1		04/01/19 15:10	7782-44-7	
REDOX	-50	mV		1		04/01/19 15:10		
Turbidity	3.6	NTU		1		04/01/19 15:10		
Apparent Color	Clear			1		04/01/19 15:10		
Odor	No			1		04/01/19 15:10		
Well Locked	No			1		04/01/19 15:10		
Purge Method	Peristaltic pump			1		04/01/19 15:10		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 240816		Lab ID: 10469117004		Collected: 04/01/19 15:10	Received: 04/01/19 16:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Total Well Depth	25.55	feet		1		04/01/19 15:10		
Depth of Water	7.90			1		04/01/19 15:10		
Well Volume Purged	9.0			1		04/01/19 15:10		
Purge Rate	0.15			1		04/01/19 15:10		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	240	mg/L	6.0	5		04/04/19 15:02	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/02/19 09:31		M3
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/11/19 14:39		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	0.14	mg/L	0.11	1	04/09/19 08:29	04/09/19 12:19	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	21.9	ug/L	20.0	1	04/15/19 11:21	04/15/19 17:32	57-12-5	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

QC Batch: 597270 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

METHOD BLANK: 3229879 Matrix: Water
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/08/19 16:14	
Barium, Dissolved	ug/L	ND	10.0	04/08/19 16:14	
Copper, Dissolved	ug/L	ND	10.0	04/08/19 16:14	
Manganese, Dissolved	ug/L	ND	5.0	04/08/19 16:14	
Nickel, Dissolved	ug/L	ND	20.0	04/08/19 16:14	
Silver, Dissolved	ug/L	ND	10.0	04/08/19 16:14	
Tin, Dissolved	ug/L	ND	75.0	04/08/19 16:14	
Zinc, Dissolved	ug/L	ND	20.0	04/08/19 16:14	

LABORATORY CONTROL SAMPLE: 3229880

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	85-115	
Barium, Dissolved	ug/L	1000	992	99	85-115	
Copper, Dissolved	ug/L	1000	932	93	85-115	
Manganese, Dissolved	ug/L	1000	1000	100	85-115	
Nickel, Dissolved	ug/L	1000	974	97	85-115	
Silver, Dissolved	ug/L	500	489	98	85-115	
Tin, Dissolved	ug/L	1000	1010	101	85-115	
Zinc, Dissolved	ug/L	1000	998	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3229881 3229882

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10469117001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21400	21600	107	108	70-130	1	20
Barium, Dissolved	ug/L	703	1000	1000	1640	1670	93	96	70-130	2	20
Copper, Dissolved	ug/L	ND	1000	1000	1010	1010	101	101	70-130	1	20
Manganese, Dissolved	ug/L	101	1000	1000	1090	1090	99	99	70-130	0	20
Nickel, Dissolved	ug/L	34.3	1000	1000	978	991	94	96	70-130	1	20
Silver, Dissolved	ug/L	ND	500	500	523	526	105	105	70-130	1	20
Tin, Dissolved	ug/L	ND	1000	1000	968	975	97	97	70-130	1	20
Zinc, Dissolved	ug/L	ND	1000	1000	936	950	93	95	70-130	1	20

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

QC Batch: 597269 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

METHOD BLANK: 3229874 Matrix: Water
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/11/19 00:11	
Arsenic, Dissolved	ug/L	ND	0.50	04/11/19 00:11	
Beryllium, Dissolved	ug/L	ND	0.20	04/11/19 00:11	
Boron, Dissolved	ug/L	ND	10.0	04/11/19 00:11	
Cadmium, Dissolved	ug/L	ND	0.080	04/11/19 00:11	
Chromium, Dissolved	ug/L	ND	0.50	04/11/19 00:11	
Cobalt, Dissolved	ug/L	ND	0.50	04/11/19 00:11	
Lead, Dissolved	ug/L	ND	0.10	04/11/19 00:11	
Selenium, Dissolved	ug/L	ND	0.50	04/11/19 00:11	
Thallium, Dissolved	ug/L	ND	0.10	04/11/19 00:11	
Uranium-238, Dissolved	ug/L	ND	0.50	04/11/19 00:11	
Vanadium, Dissolved	ug/L	ND	1.0	04/11/19 00:11	

LABORATORY CONTROL SAMPLE: 3229875

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	105	105	85-115	
Arsenic, Dissolved	ug/L	100	101	101	85-115	
Beryllium, Dissolved	ug/L	100	109	109	85-115	
Boron, Dissolved	ug/L	100	111	111	85-115	
Cadmium, Dissolved	ug/L	100	104	104	85-115	
Chromium, Dissolved	ug/L	100	104	104	85-115	
Cobalt, Dissolved	ug/L	100	105	105	85-115	
Lead, Dissolved	ug/L	100	105	105	85-115	
Selenium, Dissolved	ug/L	100	104	104	85-115	
Thallium, Dissolved	ug/L	100	103	103	85-115	
Uranium-238, Dissolved	ug/L	100	106	106	85-115	
Vanadium, Dissolved	ug/L	100	107	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3229876 3229877

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10468732001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony, Dissolved	ug/L	ND	100	100	95.8	103	96	103	70-130	7	20	
Arsenic, Dissolved	ug/L	5.9	100	100	108	109	102	103	70-130	1	20	
Beryllium, Dissolved	ug/L	ND	100	100	96.7	97.5	97	97	70-130	1	20	
Boron, Dissolved	ug/L	89.4	100	100	198	200	109	110	70-130	1	20	
Cadmium, Dissolved	ug/L	ND	100	100	97.6	99.2	98	99	70-130	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3229876 3229877											
Parameter	Units	10468732001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Chromium, Dissolved	ug/L	ND	100	100	102	106	102	106	70-130	4	20
Cobalt, Dissolved	ug/L	1.1	100	100	107	110	106	109	70-130	3	20
Lead, Dissolved	ug/L	0.15	100	100	96.8	98.7	97	99	70-130	2	20
Selenium, Dissolved	ug/L	ND	100	100	100	101	100	101	70-130	0	20
Thallium, Dissolved	ug/L	ND	100	100	96.9	98.9	97	99	70-130	2	20
Uranium-238, Dissolved	ug/L	ND	100	100	104	107	104	107	70-130	2	20
Vanadium, Dissolved	ug/L	ND	100	100	108	111	108	111	70-130	2	20

MATRIX SPIKE SAMPLE: 3229878								
Parameter	Units	10469199002	Spike	MS	MS	% Rec	Qualifiers	
		Result	Conc.	Result	% Rec	Limits		
Antimony, Dissolved	ug/L	ND	100	106	106	70-130		
Arsenic, Dissolved	ug/L	ND	100	104	103	70-130		
Beryllium, Dissolved	ug/L	ND	100	105	105	70-130		
Boron, Dissolved	ug/L	14.7	100	118	103	70-130		
Cadmium, Dissolved	ug/L	ND	100	105	105	70-130		
Chromium, Dissolved	ug/L	1.5	100	110	109	70-130		
Cobalt, Dissolved	ug/L	0.80	100	108	107	70-130		
Lead, Dissolved	ug/L	ND	100	106	106	70-130		
Selenium, Dissolved	ug/L	ND	100	102	102	70-130		
Thallium, Dissolved	ug/L	ND	100	105	105	70-130		
Uranium-238, Dissolved	ug/L	0.96	100	110	109	70-130		
Vanadium, Dissolved	ug/L	ND	100	113	113	70-130		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

QC Batch: 597142 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

METHOD BLANK: 3228857 Matrix: Water
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/03/19 08:20	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/03/19 08:20	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/03/19 08:20	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/03/19 08:20	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/03/19 08:20	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/03/19 08:20	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/03/19 08:20	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/03/19 08:20	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/03/19 08:20	
Decachlorobiphenyl (S)	%	81	30-125	04/03/19 08:20	
Tetrachloro-m-xylene (S)	%	64	30-125	04/03/19 08:20	

LABORATORY CONTROL SAMPLE & LCSD: 3228858

Parameter	Units	3228858		3228859		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
PCB-1016 (Aroclor 1016)	ug/L	2	1.8	1.8	88	90	45-125	2	20
PCB-1260 (Aroclor 1260)	ug/L	2	2.0	2.0	100	101	49-125	2	20
Decachlorobiphenyl (S)	%				102	104	30-125		
Tetrachloro-m-xylene (S)	%				71	64	30-125		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

QC Batch: 597233 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

METHOD BLANK: 3229432 Matrix: Water
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/04/19 11:04	
2,4-Dichlorophenol	ug/L	ND	10.0	04/04/19 11:04	
2,4-Dimethylphenol	ug/L	ND	10.0	04/04/19 11:04	
2,4-Dinitrophenol	ug/L	ND	10.0	04/04/19 11:04	
2-Chlorophenol	ug/L	ND	10.0	04/04/19 11:04	
2-Methylnaphthalene	ug/L	ND	10.0	04/04/19 11:04	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/04/19 11:04	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/04/19 11:04	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/04/19 11:04	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/04/19 11:04	
Acenaphthene	ug/L	ND	10.0	04/04/19 11:04	
Anthracene	ug/L	ND	10.0	04/04/19 11:04	
Benzo(a)pyrene	ug/L	ND	10.0	04/04/19 11:04	
Benzoic acid	ug/L	ND	50.0	04/04/19 11:04	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/04/19 11:04	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/04/19 11:04	
Butylbenzylphthalate	ug/L	ND	10.0	04/04/19 11:04	
Di-n-butylphthalate	ug/L	ND	10.0	04/04/19 11:04	
Di-n-octylphthalate	ug/L	ND	10.0	04/04/19 11:04	
Diethylphthalate	ug/L	ND	10.0	04/04/19 11:04	
Dimethylphthalate	ug/L	ND	10.0	04/04/19 11:04	
Fluoranthene	ug/L	ND	10.0	04/04/19 11:04	
Fluorene	ug/L	ND	10.0	04/04/19 11:04	
Hexachlorobenzene	ug/L	ND	10.0	04/04/19 11:04	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/04/19 11:04	
Hexachloroethane	ug/L	ND	10.0	04/04/19 11:04	
Isophorone	ug/L	ND	10.0	04/04/19 11:04	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/04/19 11:04	
Pentachlorophenol	ug/L	ND	20.0	04/04/19 11:04	
Phenanthrene	ug/L	ND	10.0	04/04/19 11:04	
Phenol	ug/L	ND	10.0	04/04/19 11:04	
Pyrene	ug/L	ND	10.0	04/04/19 11:04	
2,4,6-Tribromophenol (S)	%	103	52-125	04/04/19 11:04	
2-Fluorobiphenyl (S)	%	74	52-125	04/04/19 11:04	
2-Fluorophenol (S)	%	80	30-125	04/04/19 11:04	
Nitrobenzene-d5 (S)	%	90	55-125	04/04/19 11:04	
p-Terphenyl-d14 (S)	%	86	57-125	04/04/19 11:04	
Phenol-d6 (S)	%	84	30-125	04/04/19 11:04	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

LABORATORY CONTROL SAMPLE & LCSD: 3229433		3229434		LCS		LCSD		% Rec	Max	Qualifiers
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	% Rec	% Rec	Limits	RPD	RPD	
2,4,6-Trichlorophenol	ug/L	50	48.5	49.5	97	99	60-125	2	20	
2,4-Dichlorophenol	ug/L	50	46.0	47.1	92	94	56-125	2	20	
2,4-Dimethylphenol	ug/L	50	44.2	44.7	88	89	33-125	1	20	
2,4-Dinitrophenol	ug/L	50	45.0	40.4	90	81	32-125	11	20	
2-Chlorophenol	ug/L	50	41.6	42.5	83	85	52-125	2	20	
2-Methylnaphthalene	ug/L	50	33.0	35.4	66	71	52-125	7	20	
2-Methylphenol(o-Cresol)	ug/L	50	41.3	41.9	83	84	55-125	1	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	40.5	41.5	81	83	57-125	3	20	
3,3'-Dichlorobenzidine	ug/L	50	46.6J	42.4J	93	85	39-150		20	
4-Bromophenylphenyl ether	ug/L	50	44.4	49.4	89	99	61-125	11	20	
Acenaphthene	ug/L	50	39.0	41.5	78	83	59-125	6	20	
Anthracene	ug/L	50	42.4	45.9	85	92	64-125	8	20	
Benzo(a)pyrene	ug/L	50	41.6	45.1	83	90	63-125	8	20	
Benzoic acid	ug/L	50	39.3J	43.9J	79	88	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	41.4	43.7	83	87	49-125	5	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	40.8	45.2	82	90	68-125	10	20	
Butylbenzylphthalate	ug/L	50	40.6	43.2	81	86	67-125	6	20	
Di-n-butylphthalate	ug/L	50	42.1	45.3	84	91	67-125	7	20	
Di-n-octylphthalate	ug/L	50	40.1	42.6	80	85	67-125	6	20	
Diethylphthalate	ug/L	50	44.8	44.9	90	90	64-125	0	20	
Dimethylphthalate	ug/L	50	46.7	47.0	93	94	65-125	1	20	
Fluoranthene	ug/L	50	46.9	50.2	94	100	64-125	7	20	
Fluorene	ug/L	50	41.4	43.3	83	87	63-125	5	20	
Hexachlorobenzene	ug/L	50	47.6	51.7	95	103	61-125	8	20	
Hexachlorocyclopentadiene	ug/L	50	ND	21J	35	42	30-125		20	
Hexachloroethane	ug/L	50	19.4	22.2	39	44	30-125	14	20	
Isophorone	ug/L	50	47.7	48.5	95	97	59-125	2	20	
N-Nitrosodimethylamine	ug/L	50	46.5	45.3	93	91	43-125	3	20	
Pentachlorophenol	ug/L	50	48.9	52.2	98	104	35-125	7	20	
Phenanthrene	ug/L	50	43.3	46.3	87	93	65-125	7	20	
Phenol	ug/L	50	41.3	42.8	83	86	54-125	4	20	
Pyrene	ug/L	50	46.1	47.7	92	95	65-125	4	20	
2,4,6-Tribromophenol (S)	%				108	105	52-125			
2-Fluorobiphenyl (S)	%				80	80	52-125			
2-Fluorophenol (S)	%				80	81	30-125			
Nitrobenzene-d5 (S)	%				93	92	55-125			
p-Terphenyl-d14 (S)	%				94	98	57-125			
Phenol-d6 (S)	%				82	85	30-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

QC Batch: 597495 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

METHOD BLANK: 3230742 Matrix: Water
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/04/19 03:27	

LABORATORY CONTROL SAMPLE: 3230743

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3230744 3230745

Parameter	Units	10469198001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chloride	mg/L	2.6	12.5	12.5	14.5	14.5	95	95	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3230746 3230747

Parameter	Units	10469198002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chloride	mg/L	2.8	12.5	12.5	14.6	14.6	94	95	90-110	0	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

QC Batch: 597160 Analysis Method: SM 3500-Cr B Modified
 QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
 Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

METHOD BLANK: 3228996 Matrix: Water
 Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/02/19 09:31	FS

LABORATORY CONTROL SAMPLE: 3228997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.20	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3228998 3228999

Parameter	Units	10469117004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chromium, Hexavalent	mg/L	ND	0.2	0.2	.0079J	.008J	0	0	85-115		20	M3	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

QC Batch: 163940 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

METHOD BLANK: 646074 Matrix: Water
Associated Lab Samples: 10469117001, 10469117002, 10469117003, 10469117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	04/09/19 12:02	

LABORATORY CONTROL SAMPLE: 646075

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 646076 646077

Parameter	Units	12123225001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	0.15	5	5	5.4	5.3	104	104	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 646078 646079

Parameter	Units	12123229002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	ND	5	5	5.3	5.3	105	104	90-110	0	10	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

QC Batch: 598592 Analysis Method: SM 4500-CN-E
 QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
 Associated Lab Samples: 10469117001, 10469117002, 10469117003

METHOD BLANK: 3236543 Matrix: Water
 Associated Lab Samples: 10469117001, 10469117002, 10469117003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/11/19 09:22	

LABORATORY CONTROL SAMPLE: 3236544

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	247	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3236545 3236546

Parameter	Units	10468606001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	ND	250	251	250	243	100	97	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3236547 3236548

Parameter	Units	10468606002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	ND	250	266	250	246	101	93	80-120	8	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

QC Batch: 599418

Analysis Method: SM 4500-CN-E

QC Batch Method: SM 4500-CN-E

Analysis Description: SM4500CN-E Cyanide

Associated Lab Samples: 10469117004

METHOD BLANK: 3240961

Matrix: Water

Associated Lab Samples: 10469117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/15/19 17:31	

LABORATORY CONTROL SAMPLE: 3240962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	273	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3240963 3240964

Parameter	Units	10469117004 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	21.9	250	250	235	244	85	89	80-120	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3240965 3240966

Parameter	Units	10469593001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	<8.5	250	250	263	237	102	92	80-120	10	30	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Sample: 813740 **Lab ID: 10469117001** Collected: 04/01/19 10:10 Received: 04/01/19 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	16.6 ± 6.48 (8.33) C:NA T:NA	pCi/L	04/12/19 18:36	12587-46-1	
Gross Beta	EPA 900.0	59.6 ± 12.1 (6.83) C:NA T:NA	pCi/L	04/12/19 18:36	12587-47-2	

Sample: 813764 **Lab ID: 10469117002** Collected: 04/01/19 10:50 Received: 04/01/19 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	0.881 ± 6.24 (12.5) C:NA T:NA	pCi/L	04/12/19 18:36	12587-46-1	
Gross Beta	EPA 900.0	143 ± 27.6 (10.4) C:NA T:NA	pCi/L	04/12/19 18:36	12587-47-2	

Sample: 813761 **Lab ID: 10469117003** Collected: 04/01/19 13:00 Received: 04/01/19 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 10 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis. Sample would not preserve to a pH <2.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	27.9 ± 57.0 (107) C:NA T:NA	pCi/L	04/12/19 18:36	12587-46-1	
Gross Beta	EPA 900.0	365 ± 96.8 (110) C:NA T:NA	pCi/L	04/12/19 18:36	12587-47-2	

Sample: 240816 **Lab ID: 10469117004** Collected: 04/01/19 15:10 Received: 04/01/19 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	4.87 ± 3.17 (5.13) C:NA T:NA	pCi/L	04/12/19 18:36	12587-46-1	
Gross Beta	EPA 900.0	7.12 ± 3.36 (5.35) C:NA T:NA	pCi/L	04/12/19 18:36	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

QC Batch:	337115	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10469117001, 10469117002, 10469117003, 10469117004		

METHOD BLANK:	1640839	Matrix:	Water
Associated Lab Samples:	10469117001, 10469117002, 10469117003, 10469117004		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.118 ± 0.667 (1.72) C:NA T:NA	pCi/L	04/11/19 08:53	
Gross Beta	0.341 ± 0.871 (2.02) C:NA T:NA	pCi/L	04/11/19 08:53	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 597334

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 597639

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

FS The sample was filtered in the laboratory prior to analysis.

H5 Reanalysis conducted in excess of EPA method holding time. Results confirm original analysis performed in hold time.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

ANALYTE QUALIFIERS

- M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.
- P3 Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
- S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469117

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10469117001	813740	EPA Mod. 3510C	597142	EPA 8082A	597334
10469117002	813764	EPA Mod. 3510C	597142	EPA 8082A	597334
10469117003	813761	EPA Mod. 3510C	597142	EPA 8082A	597334
10469117004	240816	EPA Mod. 3510C	597142	EPA 8082A	597334
10469117001	813740	EPA 200.7	597270	EPA 200.7	597565
10469117002	813764	EPA 200.7	597270	EPA 200.7	597565
10469117003	813761	EPA 200.7	597270	EPA 200.7	597565
10469117004	240816	EPA 200.7	597270	EPA 200.7	597565
10469117001	813740	EPA 200.8	597269	EPA 200.8	598489
10469117002	813764	EPA 200.8	597269	EPA 200.8	598489
10469117003	813761	EPA 200.8	597269	EPA 200.8	598489
10469117004	240816	EPA 200.8	597269	EPA 200.8	598489
10469117001	813740	EPA 3520	597233	EPA 8270D	597639
10469117002	813764	EPA 3520	597233	EPA 8270D	597639
10469117003	813761	EPA 3520	597233	EPA 8270D	597639
10469117004	240816	EPA 3520	597233	EPA 8270D	597639
10469117001	813740				
10469117002	813764				
10469117003	813761				
10469117004	240816				
10469117001	813740	EPA 900.0	337115		
10469117002	813764	EPA 900.0	337115		
10469117003	813761	EPA 900.0	337115		
10469117004	240816	EPA 900.0	337115		
10469117001	813740	EPA 300.0	597495		
10469117002	813764	EPA 300.0	597495		
10469117003	813761	EPA 300.0	597495		
10469117004	240816	EPA 300.0	597495		
10469117001	813740	SM 3500-Cr B Modified	597160		
10469117002	813764	SM 3500-Cr B Modified	597160		
10469117003	813761	SM 3500-Cr B Modified	597160		
10469117004	240816	SM 3500-Cr B Modified	597160		
10469117001	813740	EPA 350.1			
10469117002	813764	EPA 350.1			
10469117003	813761	EPA 350.1			
10469117004	240816	EPA 350.1			
10469117001	813740	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10469117002	813764	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10469117003	813761	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10469117004	240816	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10469117001	813740	SM 4500-CN-E	598592	SM 4500-CN-E	598682
10469117002	813764	SM 4500-CN-E	598592	SM 4500-CN-E	598682
10469117003	813761	SM 4500-CN-E	598592	SM 4500-CN-E	598682

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469117

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10469117004	240816	SM 4500-CN-E	599418	SM 4500-CN-E	599555

REPORT OF LABORATORY ANALYSIS

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WO#: 10469117



10469117



Minnesota Pollution Control Agency

Work Order Number:

COC Type:

Page: / of /

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MNSW-057

Program Code (MDH Lab Only):

Lab Name: Pace Analytical - Minneapolis, MN

Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters

Project Task Code: PRJ07786

Address: 1700 SE Elm Street

Project Manager: Brad Jacobson

612-607-6375

EPIC PROFILE #: 38716 Line 2

Minneapolis

MN

55414

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe
AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wtr-Ground=Groundwater
Wtr-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/ Unionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SVOC, 8082, MDA1, MDA2 - QAPP Table 3a	Lab Sample No.	#
813740	sample	4/1/19	1010			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	001	1
813764	sample	4/1/19	1050			G	NW	Wtr-Ground	N		10	X	X	X	X	X	X	X	002	2
813761	sample	4/1/19	1300			G	NW	Wtr-Ground	N	DATA 4/1/19	14	X	X	X	X	X	X	X	003	3
240816	sample	4/1/19	1510			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	X	004	4
									N											5
									N											6
									N											7
									N											8
									N											9
									N											10

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	4/1/19/1620	[Signature]	4/1/19/1625

Sample 813761 is leachate like sample.

4.1
2.5
3.0
4.5

Sample Condition Upon Receipt **Client Name:** MPLA **Project #:** **WO# 10469117**

Courier: Fed Ex UPS USPS Client
 Pace SpeedDee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Biological Tissue Frozen?** Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer: G87A9155100842 G87A9170600254 **Type of Ice:** Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C **Cooler Temp Read w/temp blank:** 4.1, 2.5, 3.0, 4.5 °C **Average Corrected Temp (no temp blank only):** _____ °C See Exceptions

Correction Factor: 1.2 **Cooler Temp Corrected w/temp blank:** 4.1, 2.5, 3.0, 4.5 °C

USDA Regulated Soil: N/A, water sample/Other: _____ **Date/Initials of Person Examining Contents:** 4/1/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <u>P²²⁸ JMA</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: <u>CM 4/2/19</u> See Exception <input type="checkbox"/>
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>1-4 3/2</u> <u>1-4 1/2</u> <u>1-4 1/1</u> <input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate <u>CM 4/2/19</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No See Exception <input type="checkbox"/>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Chlorine? <input checked="" type="checkbox"/> No See Exception <input type="checkbox"/>
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): <u>NA</u>
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No


Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature] **Date:** 04/02/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: [Signature] CM
CM 4/2/19

	Document Name: SCUR Exception Form – Coolers Above 6°C	Document Revised: 04Feb2019 Page 1 of 1
	Document No.: F-MN-C-298-Rev.01	Issuing Authority: Pace Minnesota Quality Office

During sample triage, this form is to be placed in each cooler that arrives above 6.0 degrees Celsius

SCUR Exceptions:

Workorder #:

Out of Temp Sample IDs	Container Type	# of Containers	PM Notified? <input type="checkbox"/> Yes <input type="checkbox"/> No																								
			If yes, indicate who was contacted/date/time. If no, indicate reason why.																								
			Multiple Cooler Project? <input type="checkbox"/> Yes <input type="checkbox"/> No If you answered yes, fill out information to the left.																								
			<table border="1"> <thead> <tr> <th colspan="3">No Temp Blank</th> </tr> <tr> <th>Read Temp</th> <th>Corrected Temp</th> <th>Average Temp</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	No Temp Blank			Read Temp	Corrected Temp	Average Temp																		
No Temp Blank																											
Read Temp	Corrected Temp	Average Temp																									

Other Issues

Issue Type:	Container Type	# of Containers
Sample ID		

Tracking Number	

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preserv.	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance after addition?	Initials
813764	HNO ₃	7	4/2/19	1247	1.0	118100	1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	CMI
"	H ₂ SO ₄	4	4/2/19	1253	1.0	3117051	1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	CMI
813761	HNO ₃	5	4/2/19	1251	1.0	118100	5	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No CM 4/2/19	CMI
"	H ₂ SO ₄	5	4/2/19	1256	1.0	3117051	4	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	CMI



Sample Condition Upon Receipt

Client Name: Pace MPLS Project #: _____

WO#: 12123159

PM: CLJ Due Date: 04/22/19
 CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: SD

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 111336683 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.6 Cooler Temp Corrected °C: 1.9 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: RH/3/19

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>NT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Katie Richards Date: 4/3/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace MN

Project # **# 30287398**

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 463801956652

Label <u>MJS</u>
LIMS Login <u>MJ</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>MJS 4319</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>wt</u>	/			5.
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used: -Pace Containers Used:	/			10.
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16. added 5 mL of HNO ₃ to Sample 002
All containers needing preservation are found to be in compliance with EPA recommendation.		/		added 10 mL of HNO ₃ to Sample 003 Sample is still preserved
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>MJS</u> Date/time of preservation <u>4319/330</u>
				Lot # of added preservative <u>DL9-0234</u>
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>MJS</u> Date: <u>4319</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



12-Apr-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10469117**

Work Order: **1904149**

Dear Jennifer,

ALS Environmental received 4 samples on 03-Apr-2019 09:45 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 10.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton".

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10469117
Work Order: 1904149

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1904149-01	813740	Water		4/1/2019 10:10	4/3/2019 09:45	<input type="checkbox"/>
1904149-02	813764	Water		4/1/2019 10:50	4/3/2019 09:45	<input type="checkbox"/>
1904149-03	813761	Water		4/1/2019 13:00	4/3/2019 09:45	<input type="checkbox"/>
1904149-04	240816	Water		4/1/2019 15:10	4/3/2019 09:45	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10469117
WorkOrder: 1904149

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10469117

Work Order: 1904149

Sample ID: 813740

Lab ID: 1904149-01

Collection Date: 4/1/2019 10:10 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC
Project: 10469117
Sample ID: 813764
Collection Date: 4/1/2019 10:50 AM

Work Order: 1904149
Lab ID: 1904149-02
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE Cyanide, Free	ND		SW9014 20	µg/L	1	Analyst: RZM 4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10469117

Work Order: 1904149

Sample ID: 813761

Lab ID: 1904149-03

Collection Date: 4/1/2019 01:00 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Apr-19

Client: Pace Analytical Services, LLC

Project: 10469117

Work Order: 1904149

Sample ID: 240816

Lab ID: 1904149-04

Collection Date: 4/1/2019 03:10 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/8/2019 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 1904149
Project: 10469117

QC BATCH REPORT

Batch ID: **R258103** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R258103-R258103				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596554		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free ND 20

LCS		Sample ID: LCS-R258103-R258103				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596555		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 264.9 20 250 0 106 81-119 0

MS		Sample ID: 1904010-01A MS				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596560		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 264.9 20 250 -6.48 109 81-119 0

MSD		Sample ID: 1904010-01A MSD				Units: µg/L		Analysis Date: 4/8/2019 10:30 AM		
Client ID:		Run ID: WETCHEM_190408Q		SeqNo: 5596561		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 247.2 20 250 -6.48 101 81-119 264.9 6.91 20

The following samples were analyzed in this batch:

1904149-01A	1904149-02A	1904149-03A
1904149-04A		

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **03-Apr-19 09:45**

Work Order: **1904149**

Received by: **DS**

Checklist completed by Diane Shaw 03-Apr-19
eSignature Date

Reviewed by: Chad Whilton 03-Apr-19
eSignature Date

Matrices: Water

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No
- Sample(s) received on ice? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

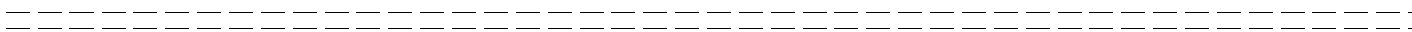
Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:



Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 16, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/03/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAP Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2019
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
813740	A191407-01	Water	04/01/2019	04/03/2019
813764	A191407-02	Water	04/01/2019	04/03/2019
813761	A191407-03	Water	04/01/2019	04/03/2019
240816	A191407-04	Water	04/01/2019	04/03/2019

CASE NARRATIVE

Sample Receipt Information:

4 samples were received on 04/03/2019. Samples were received at 2.6 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Sample Preparation:

Due to the sample matrix, only 100 mL of sample A191407-03 was used in the MDA List 1 and MDA List 2 extractions. Sample A191407-03 was also analyzed at an initial dilution factor of 1:10 for these analyses. The reporting limits have been raised accordingly and the sample is reported to the limit of detection.

Laboratory Control Samples (LCS):

The E1 footnote on samples A191407-01 through A191407-04 indicates that there were quality control sample exceedances for terbufos. The LCS recovery was below acceptable limits. Please see the quality control section of the report for more information.

The LCS and LCS duplicate recoveries indicate a potential high bias for ethalfluralin, fonofos, propachlor and triallate for samples A191407-01 through A191407-04. Samples were less than the reporting limit for these analytes so no further action is required.

Continuing Calibration Verification (CCV):

The LC footnote on sample A191407-03 states that there was a low CCV recovery for picloram. The lower control limit is 80% and the lowest recovery was 78.1%.

CCV indicates a potential high bias for cyanazine, ethalfluralin, pendimethalin and trifluralin for samples A191407-01 through A191407-04. Samples were less than the reporting limit for these analytes so no further action is required.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

813740

Date Sampled

A191407-01 (Water)

04/01/2019 10:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 14:56	EPA 8270D	

Surrogate: Atrazine-d5		98.0 %		56.9-123	04/04/2019	04/09/2019 14:56	EPA 8270D	
Surrogate: Parathion-d10		115 %		23.8-169	04/04/2019	04/09/2019 14:56	EPA 8270D	
Surrogate: Triphenyl phosphate		106 %		50.5-178	04/04/2019	04/09/2019 14:56	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904151

2,4-D	ND	0.50	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/08/2019	04/10/2019 02:29	EPA 8151A	

Surrogate: 2,4-D-d5		91.6 %		44.2-121	04/08/2019	04/10/2019 02:29	EPA 8151A	
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2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

813764

Date Sampled

A191407-02 (Water)

04/01/2019 10:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 15:24	EPA 8270D	
Surrogate: Atrazine-d5		141 %	56.9-123		04/04/2019	04/09/2019 15:24	EPA 8270D	S
Surrogate: Parathion-d10		148 %	23.8-169		04/04/2019	04/09/2019 15:24	EPA 8270D	
Surrogate: Triphenyl phosphate		172 %	50.5-178		04/04/2019	04/09/2019 15:24	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904151

2,4-D	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:04	EPA 8151A	
Surrogate: 2,4-D-d5		94.4 %	44.2-121		04/08/2019	04/10/2019 03:04	EPA 8151A	



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 202
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

813761

Date Sampled
04/01/2019 13:00

A191407-03 (Water)

Analyte	Result	Limit of Detection	Limit of Quantitation	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	2.5	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Alachlor	ND	5.0	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Atrazine	ND	2.5	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Chlorpyrifos	ND	3.8	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Cyanazine	ND	6.0	20	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Desethylatrazine	ND	2.2	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Deisopropylatrazine	ND	3.9	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Dimethenamid	ND	2.5	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
EPTC	ND	2.3	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Ethalfuralin	ND	9.6	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Fonofos	ND	4.6	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Metolachlor	ND	3.0	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Metribuzin	ND	1.9	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Pendimethalin	ND	2.8	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Phorate	ND	5.5	30	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Prometon	ND	3.3	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Propachlor	ND	4.6	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Propazine	ND	4.3	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Simazine	ND	2.3	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Terbufos	ND	4.0	20	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	E1
Triallate	ND	6.5	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	
Trifluralin	ND	2.8	50	ug/L	10	04/04/2019	04/09/2019 18:40	EPA 8270D	

Surrogate: Atrazine-d5		253 %	56.9-123			04/04/2019	04/09/2019 18:40	EPA 8270D	D, S
Surrogate: Parathion-d10		145 %	23.8-169			04/04/2019	04/09/2019 18:40	EPA 8270D	D
Surrogate: Triphenyl phosphate		252 %	50.5-178			04/04/2019	04/09/2019 18:40	EPA 8270D	D, S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904151

2,4-D	ND	14	50	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	
2,4-DB	ND	10	50	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	
2,4,5-T	ND	6.5	50	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	
2,4,5-TP (Silvex)	ND	5.1	50	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	
Bentazon	ND	13	50	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	
Dicamba	ND	3.8	50	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	
MCPA	ND	7.3	30	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	
Picloram	ND	4.4	50	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	LC
Triclopyr	ND	8.5	50	ug/L	10	04/08/2019	04/10/2019 10:39	EPA 8151A	

Surrogate: 2,4-D-d5		163 %	44.2-121			04/08/2019	04/10/2019 10:39	EPA 8151A	D, S
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2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

240816

Date Sampled

A191407-04 (Water)

04/01/2019 15:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904147

Acetochlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	E1
Triallate	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/04/2019	04/09/2019 12:07	EPA 8270D	
<i>Surrogate: Atrazine-d5</i>		92.9 %	56.9-123		04/04/2019	04/09/2019 12:07	EPA 8270D	
<i>Surrogate: Parathion-d10</i>		132 %	23.8-169		04/04/2019	04/09/2019 12:07	EPA 8270D	
<i>Surrogate: Triphenyl phosphate</i>		106 %	50.5-178		04/04/2019	04/09/2019 12:07	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904151

2,4-D	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/08/2019	04/10/2019 03:39	EPA 8151A	
<i>Surrogate: 2,4-D-d5</i>		79.5 %	44.2-121		04/08/2019	04/10/2019 03:39	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904147 - EPA 3510C

Blank (A904147-BLK1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:08

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>0.511</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>1.07</i>		<i>ug/L</i>	<i>0.5000</i>		<i>215</i>	<i>23.8-169</i>			<i>S</i>
<i>Surrogate: Triphenyl phosphate</i>	<i>0.453</i>		<i>ug/L</i>	<i>0.5000</i>		<i>90.6</i>	<i>50.5-178</i>			

LCS (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:36

Acetochlor	0.817	0.50	ug/L	1.000		81.7	67.8-122			
Alachlor	0.819	0.50	ug/L	1.000		81.9	68.6-119			
Atrazine	0.802	0.50	ug/L	1.000		80.2	68.6-115			
Chlorpyrifos	0.841	0.50	ug/L	1.000		84.1	63.1-120			
Cyanazine	0.832	0.20	ug/L	1.000		83.2	55.3-143			
Desethylatrazine	0.766	0.50	ug/L	1.000		76.6	67.8-115			
Deisopropylatrazine	0.594	0.50	ug/L	1.000		59.4	50.1-100			
Dimethenamid	0.795	0.50	ug/L	1.000		79.5	70.3-121			
EPTC	0.649	0.50	ug/L	1.000		64.9	50.4-101			
Ethalfuralin	1.87	0.50	ug/L	1.000		187	42.6-121			
Fonofos	1.62	0.50	ug/L	1.000		162	56.6-119			
Metolachlor	0.822	0.50	ug/L	1.000		82.2	71.3-128			
Metribuzin	0.760	0.50	ug/L	1.000		76.0	64.9-120			
Pendimethalin	0.841	0.50	ug/L	1.000		84.1	60.9-128			
Phorate	0.477	0.30	ug/L	1.000		47.7	37.3-112			
Prometon	0.799	0.50	ug/L	1.000		79.9	67.1-120			
Propachlor	1.92	0.50	ug/L	1.000		192	66.2-127			
Propazine	0.800	0.50	ug/L	1.000		80.0	68.2-118			
Simazine	0.800	0.50	ug/L	1.000		80.0	67.2-117			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904147 - EPA 3510C

LCS (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 18:36

Terbufos	0.283	0.20	ug/L	1.000		28.3	34.3-111			
Triallate	1.82	0.50	ug/L	1.000		182	53-121			
Trifluralin	0.759	0.50	ug/L	1.000		75.9	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.447</i>		<i>ug/L</i>	<i>0.5000</i>		<i>89.4</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.952</i>		<i>ug/L</i>	<i>0.5000</i>		<i>190</i>	<i>23.8-169</i>			S
<i>Surrogate: Triphenyl phosphate</i>	<i>0.418</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.5</i>	<i>50.5-178</i>			

LCS Dup (A904147-BS1)

Prepared: 04/04/2019 Analyzed: 04/08/2019 19:04

Acetochlor	0.885	0.50	ug/L	1.000		88.5	67.8-122	7.93	20	
Alachlor	0.867	0.50	ug/L	1.000		86.7	68.6-119	5.69	20	
Atrazine	0.846	0.50	ug/L	1.000		84.6	68.6-115	5.34	20	
Chlorpyrifos	0.897	0.50	ug/L	1.000		89.7	63.1-120	6.43	20	
Cyanazine	0.904	0.20	ug/L	1.000		90.4	55.3-143	8.21	20	
Desethylatrazine	0.822	0.50	ug/L	1.000		82.2	67.8-115	7.00	20	
Deisopropylatrazine	0.616	0.50	ug/L	1.000		61.6	50.1-100	3.55	20	
Dimethenamid	0.855	0.50	ug/L	1.000		85.5	70.3-121	7.20	20	
EPTC	0.742	0.50	ug/L	1.000		74.2	50.4-101	13.3	20	
Ethalfuralin	1.47	0.50	ug/L	1.000		147	42.6-121	24.0	20	X
Fonofos	1.35	0.50	ug/L	1.000		135	56.6-119	17.8	20	
Metolachlor	0.886	0.50	ug/L	1.000		88.6	71.3-128	7.43	20	
Metribuzin	0.789	0.50	ug/L	1.000		78.9	64.9-120	3.69	20	
Pendimethalin	0.888	0.50	ug/L	1.000		88.8	60.9-128	5.41	20	
Phorate	0.541	0.30	ug/L	1.000		54.1	37.3-112	12.7	20	
Prometon	0.831	0.50	ug/L	1.000		83.1	67.1-120	3.92	20	
Propachlor	1.63	0.50	ug/L	1.000		163	66.2-127	16.7	20	
Propazine	0.874	0.50	ug/L	1.000		87.4	68.2-118	8.91	20	
Simazine	0.883	0.50	ug/L	1.000		88.3	67.2-117	9.75	20	
Terbufos	0.366	0.20	ug/L	1.000		36.6	34.3-111	25.7	20	X
Triallate	1.57	0.50	ug/L	1.000		157	53-121	14.6	20	
Trifluralin	0.805	0.50	ug/L	1.000		80.5	45.9-116	5.95	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.478</i>		<i>ug/L</i>	<i>0.5000</i>		<i>95.7</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.842</i>		<i>ug/L</i>	<i>0.5000</i>		<i>168</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.410</i>		<i>ug/L</i>	<i>0.5000</i>		<i>82.1</i>	<i>50.5-178</i>			



Pace Analytical
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Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904151 - EPA 3510C

Blank (A904151-BLK1)

Prepared: 04/08/2019 Analyzed: 04/10/2019 00:08

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
<i>Surrogate: 2,4-D-d5</i>	1.75		ug/L	2.006		87.4	44.2-121			

LCS (A904151-BS1)

Prepared: 04/08/2019 Analyzed: 04/10/2019 01:19

2,4-D	1.92	0.50	ug/L	2.000		96.0	64.6-148			
2,4-DB	1.99	0.50	ug/L	2.000		99.6	66.7-143			
2,4,5-T	1.72	0.50	ug/L	2.000		86.0	63.4-133			
2,4,5-TP (Silvex)	1.94	0.50	ug/L	2.000		96.9	63-145			
Bentazon	0.994	0.50	ug/L	1.000		99.4	52.5-139			
Dicamba	1.78	0.50	ug/L	2.000		89.1	55.4-143			
MCPA	1.95	0.30	ug/L	2.000		97.4	33.5-143			
Picloram	0.794	0.50	ug/L	1.000		79.4	47.9-113			
Triclopyr	1.89	0.50	ug/L	2.000		94.7	65.1-141			
<i>Surrogate: 2,4-D-d5</i>	1.78		ug/L	2.006		88.5	44.2-121			

LCS Dup (A904151-BSD1)

Prepared: 04/08/2019 Analyzed: 04/10/2019 01:54

2,4-D	1.96	0.50	ug/L	2.000		98.2	64.6-148	2.17	20	
2,4-DB	2.00	0.50	ug/L	2.000		100	66.7-143	0.436	20	
2,4,5-T	1.83	0.50	ug/L	2.000		91.5	63.4-133	6.23	20	
2,4,5-TP (Silvex)	1.96	0.50	ug/L	2.000		97.9	63-145	1.00	20	
Bentazon	1.01	0.50	ug/L	1.000		101	52.5-139	1.64	20	
Dicamba	1.82	0.50	ug/L	2.000		90.8	55.4-143	1.83	20	
MCPA	1.90	0.30	ug/L	2.000		95.2	33.5-143	2.33	20	
Picloram	0.715	0.50	ug/L	1.000		71.5	47.9-113	10.4	20	
Triclopyr	1.94	0.50	ug/L	2.000		96.9	65.1-141	2.40	20	
<i>Surrogate: 2,4-D-d5</i>	1.73		ug/L	2.006		86.0	44.2-121			

Pace Analytical
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Project: MPCA Freeway LF Water - MN
Project Number: 10469117
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- E1 Estimated value because of quality control sample exceedances.
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A191407



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Workorder: 10469117

Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Owner Received Date: 4/1/2019

Results Requested By: 4/22/2019

Report To		Subcontract To					Requested Analysis																															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				MDA List 1	MDA List 2											LAB USE ONLY																
						Unpreserved	AGIU																															
1	813740	PS	4/1/2019 10:10	10469117001	Water	4					X	X																										01
2	813764	PS	4/1/2019 10:50	10469117002	Water	2					X	X																									02	
3	813761	PS	4/1/2019 13:00	10469117003	Water	3					X	X																									03	
4	240816	PS	4/1/2019 15:10	10469117004	Water	4					X	X																									04	
5																																						

Transfers					Comments									
Released By	Date/Time	Received By	Date/Time											
<i>[Signature]</i>	4/2/19 8:15	<i>[Signature]</i>	4/3/19 16:57		Need MPCA Equis EDD and Barr Equis 5 EDD									

Cooler Temperature on Receipt <i>2:6°C</i>	Custody Seal <input checked="" type="checkbox"/> Y or N	Received on Ice <input checked="" type="checkbox"/> Y or N	Samples Intact <input checked="" type="checkbox"/> Y or N
--	---	--	---

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp 7/13/19

April 19, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469389

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 03, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469389

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485	Minnesota Dept of Ag Certification #: via MN 027-053-137
A2LA Certification #: 2926.01	Minnesota Petrofund Certification #: 1240
Alabama Certification #: 40770	Mississippi Certification #: MN00064
Alaska Contaminated Sites Certification #: 17-009	Missouri Certification #: 10100
Alaska DW Certification #: MN00064	Montana Certification #: CERT0092
Arizona Certification #: AZ0014	Nebraska Certification #: NE-OS-18-06
Arkansas DW Certification #: MN00064	Nevada Certification #: MN00064
Arkansas WW Certification #: 88-0680	New Hampshire Certification #: 2081
California Certification #: 2929	New Jersey Certification #: MN002
CNMI Saipan Certification #: MP0003	New York Certification #: 11647
Colorado Certification #: MN00064	North Carolina DW Certification #: 27700
Connecticut Certification #: PH-0256	North Carolina WW Certification #: 530
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137	North Dakota Certification #: R-036
Florida Certification #: E87605	Ohio DW Certification #: 41244
Georgia Certification #: 959	Ohio VAP Certification #: CL101
Guam EPA Certification #: MN00064	Oklahoma Certification #: 9507
Hawaii Certification #: MN00064	Oregon Primary Certification #: MN300001
Idaho Certification #: MN00064	Oregon Secondary Certification #: MN200001
Illinois Certification #: 200011	Pennsylvania Certification #: 68-00563
Indiana Certification #: C-MN-01	Puerto Rico Certification #: MN00064
Iowa Certification #: 368	South Carolina Certification #: 74003001
Kansas Certification #: E-10167	Tennessee Certification #: TN02818
Kentucky DW Certification #: 90062	Texas Certification #: T104704192
Kentucky WW Certification #: 90062	Utah Certification #: MN00064
Louisiana DEQ Certification #: 03086	Vermont Certification #: VT-027053137
Louisiana DW Certification #: MN00064	Virginia Certification #: 460163
Maine Certification #: MN00064	Washington Certification #: C486
Maryland Certification #: 322	West Virginia DEP Certification #: 382
Massachusetts Certification #: M-MN064	West Virginia DW Certification #: 9952 C
Michigan Certification #: 9909	Wisconsin Certification #: 999407970
Minnesota Certification #: 027-053-137	Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792	North Dakota Certification: # R-203
Alaska Certification UST-107	Wisconsin DNR Certification #: 998027470
Montana Certificate #CERT0103	WA Department of Ecology Lab ID# C1007
Minnesota Dept of Health Certification #: 027-137-445	

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601	Georgia Certification #: C040
ANAB DOD-ELAP Rad Accreditation #: L2417	Guam Certification
Alabama Certification #: 41590	Florida: Cert E871149 SEKS WET
Arizona Certification #: AZ0734	Hawaii Certification
Arkansas Certification	Idaho Certification
California Certification #: 04222CA	Illinois Certification
Colorado Certification #: PA01547	Indiana Certification
Connecticut Certification #: PH-0694	Iowa Certification #: 391
Delaware Certification	Kansas/TNI Certification #: E-10358
EPA Region 4 DW Rad	Kentucky Certification #: KY90133
Florida/TNI Certification #: E87683	KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10469389001	834662	Water	04/03/19 09:20	04/03/19 14:35
10469389002	834663	Water	04/03/19 10:40	04/03/19 14:35
10469389003	834661	Water	04/03/19 11:35	04/03/19 14:35
10469389004	FB-2	Water	04/03/19 12:30	04/03/19 14:35
10469389005	834660	Water	04/03/19 13:30	04/03/19 14:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10469389001	834662	EPA 8082A	RAG	11	PASI-M		
		EPA 200.7	DM	9	PASI-M		
		EPA 200.8	BWB	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	CLA	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10469389002	834663	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
EPA 200.8	BWB			12	PASI-M		
EPA 8270D	STB			38	PASI-M		
	CLJ			16	PASI-V		
EPA 900.0	CLA			2	PASI-PA		
EPA 300.0	KEO			1	PASI-M		
SM 3500-Cr B Modified	JFP			1	PASI-M		
EPA 350.1	CLJ			1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V		
SM 4500-CN-E	DCL			1	PASI-M		
10469389003	834661			EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
		EPA 200.8	BWB	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	CLA	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10469389004	FB-2	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
EPA 200.8	BWB			12	PASI-M		
EPA 8270D	STB			38	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10469389005	834660	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	BWB	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834662	Lab ID: 10469389001	Collected: 04/03/19 09:20	Received: 04/03/19 14:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 10:36	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	51	%	30-125	1	04/04/19 17:38	04/08/19 10:36	877-09-8	
Decachlorobiphenyl (S)	58	%	30-125	1	04/04/19 17:38	04/08/19 10:36	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/08/19 05:43	04/08/19 14:56	7429-90-5	
Barium, Dissolved	354	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:56	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:56	7440-50-8	
Manganese, Dissolved	433	ug/L	5.0	1	04/08/19 05:43	04/08/19 14:56	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 14:56	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:56	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/08/19 05:43	04/08/19 14:56	7440-31-5	
Total Hardness by 2340B, Dissolved	883000	ug/L	3300	1	04/08/19 05:43	04/08/19 14:56		
Zinc, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 14:56	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:11	7440-36-0	
Arsenic, Dissolved	0.84	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:11	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/08/19 05:43	04/08/19 18:11	7440-41-7	
Boron, Dissolved	20600	ug/L	2000	200	04/08/19 05:43	04/09/19 18:50	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/08/19 05:43	04/08/19 18:11	7440-43-9	
Chromium, Dissolved	0.65	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:11	7440-47-3	
Cobalt, Dissolved	1.0	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:11	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:11	7439-92-1	
Selenium, Dissolved	7.0	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:11	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:11	7440-28-0	
Uranium-238, Dissolved	10.6	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:11	7440-61-1	
Vanadium, Dissolved	1.7	ug/L	1.0	1	04/08/19 05:43	04/08/19 18:11	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	83-32-9	
Anthracene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	50-32-8	
Benzoic acid	ND	ug/L	48.8	1	04/04/19 16:18	04/08/19 16:15	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834662 Lab ID: 10469389001 Collected: 04/03/19 09:20 Received: 04/03/19 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
------------	---------	-------	--------------	----	----------	----------	---------	------

8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.8	1	04/04/19 16:18	04/08/19 16:15	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	206-44-0	
Fluorene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.8	1	04/04/19 16:18	04/08/19 16:15	77-47-4	
Hexachloroethane	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	67-72-1	
Isophorone	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.5	1	04/04/19 16:18	04/08/19 16:15		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	62-75-9	
Pentachlorophenol	ND	ug/L	19.5	1	04/04/19 16:18	04/08/19 16:15	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	85-01-8	
Phenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	108-95-2	
Pyrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:15	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	69	%.	55-125	1	04/04/19 16:18	04/08/19 16:15	4165-60-0	
2-Fluorobiphenyl (S)	71	%.	52-125	1	04/04/19 16:18	04/08/19 16:15	321-60-8	
p-Terphenyl-d14 (S)	68	%.	57-125	1	04/04/19 16:18	04/08/19 16:15	1718-51-0	
Phenol-d6 (S)	67	%.	30-125	1	04/04/19 16:18	04/08/19 16:15	13127-88-3	
2-Fluorophenol (S)	64	%.	30-125	1	04/04/19 16:18	04/08/19 16:15	367-12-4	
2,4,6-Tribromophenol (S)	80	%.	52-125	1	04/04/19 16:18	04/08/19 16:15	118-79-6	

Field Data

Analytical Method:

Collected Date	04/03/19			1		04/03/19 09:20		
Collected Time	0920			1		04/03/19 09:20		
Field pH	6.6	Std. Units		1		04/03/19 09:20		
Field Temperature	10.0	deg C		1		04/03/19 09:20		
Field Specific Conductance	1850	umhos/cm		1		04/03/19 09:20		
Oxygen, Dissolved	0.7	mg/L		1		04/03/19 09:20	7782-44-7	
REDOX	5	mV		1		04/03/19 09:20		
Turbidity	4.5	NTU		1		04/03/19 09:20		
Apparent Color	Clear			1		04/03/19 09:20		
Odor	No			1		04/03/19 09:20		
Well Locked	No			1		04/03/19 09:20		
Purge Method	Peristaltic pump			1		04/03/19 09:20		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834662		Lab ID: 10469389001		Collected: 04/03/19 09:20	Received: 04/03/19 14:35	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Total Well Depth	21.32	feet		1		04/03/19 09:20		
Depth of Water	14.98			1		04/03/19 09:20		
Well Volume Purged	3.15			1		04/03/19 09:20		
Purge Rate	0.15			1		04/03/19 09:20		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	38.9	mg/L	1.2	1		04/05/19 00:07	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/03/19 16:06		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/10/19 16:18		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	7.2	mg/L	0.11	1	04/09/19 08:29	04/09/19 12:38	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	23.2	ug/L	20.0	1	04/15/19 11:21	04/16/19 08:47	57-12-5	

Sample: 834663		Lab ID: 10469389002		Collected: 04/03/19 10:40	Received: 04/03/19 14:35	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 10:51	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	49	%	30-125	1	04/04/19 17:38	04/08/19 10:51	877-09-8	
Decachlorobiphenyl (S)	30	%	30-125	1	04/04/19 17:38	04/08/19 10:51	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/08/19 05:43	04/08/19 14:58	7429-90-5	
Barium, Dissolved	545	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:58	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:58	7440-50-8	
Manganese, Dissolved	478	ug/L	5.0	1	04/08/19 05:43	04/08/19 14:58	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 14:58	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:58	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834663	Lab ID: 10469389002	Collected: 04/03/19 10:40	Received: 04/03/19 14:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	04/08/19 05:43	04/08/19 14:58	7440-31-5	
Total Hardness by 2340B, Dissolved	925000	ug/L	3300	1	04/08/19 05:43	04/08/19 14:58		
Zinc, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 14:58	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:17	7440-36-0	
Arsenic, Dissolved	0.79	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:17	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/08/19 05:43	04/08/19 18:17	7440-41-7	
Boron, Dissolved	38400	ug/L	2000	200	04/08/19 05:43	04/09/19 18:53	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/08/19 05:43	04/08/19 18:17	7440-43-9	
Chromium, Dissolved	2.3	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:17	7440-47-3	
Cobalt, Dissolved	0.87	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:17	7440-48-4	
Lead, Dissolved	0.76	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:17	7439-92-1	
Selenium, Dissolved	0.94	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:17	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:17	7440-28-0	
Uranium-238, Dissolved	0.85	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:17	7440-61-1	
Vanadium, Dissolved	2.8	ug/L	1.0	1	04/08/19 05:43	04/08/19 18:17	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	83-32-9	
Anthracene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	50-32-8	
Benzoic acid	ND	ug/L	48.8	1	04/04/19 16:18	04/08/19 16:40	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	111-44-4	
2-Chlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.8	1	04/04/19 16:18	04/08/19 16:40	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	206-44-0	
Fluorene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.8	1	04/04/19 16:18	04/08/19 16:40	77-47-4	
Hexachloroethane	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	67-72-1	
Isophorone	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.5	1	04/04/19 16:18	04/08/19 16:40		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834663	Lab ID: 10469389002	Collected: 04/03/19 10:40	Received: 04/03/19 14:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Pentachlorophenol	ND	ug/L	19.5	1	04/04/19 16:18	04/08/19 16:40	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	85-01-8	
Phenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	108-95-2	
Pyrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 16:40	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	79	%	55-125	1	04/04/19 16:18	04/08/19 16:40	4165-60-0	
2-Fluorobiphenyl (S)	78	%	52-125	1	04/04/19 16:18	04/08/19 16:40	321-60-8	
p-Terphenyl-d14 (S)	72	%	57-125	1	04/04/19 16:18	04/08/19 16:40	1718-51-0	
Phenol-d6 (S)	78	%	30-125	1	04/04/19 16:18	04/08/19 16:40	13127-88-3	
2-Fluorophenol (S)	76	%	30-125	1	04/04/19 16:18	04/08/19 16:40	367-12-4	
2,4,6-Tribromophenol (S)	89	%	52-125	1	04/04/19 16:18	04/08/19 16:40	118-79-6	
Field Data								
Analytical Method:								
Collected Date	04/03/19			1		04/03/19 10:40		
Collected Time	1040			1		04/03/19 10:40		
Field pH	6.6	Std. Units		1		04/03/19 10:40		
Field Temperature	11.0	deg C		1		04/03/19 10:40		
Field Specific Conductance	2180	umhos/cm		1		04/03/19 10:40		
Oxygen, Dissolved	0.5	mg/L		1		04/03/19 10:40	7782-44-7	
REDOX	-88	mV		1		04/03/19 10:40		
Turbidity	14	NTU		1		04/03/19 10:40		
Apparent Color	Clear			1		04/03/19 10:40		
Odor	No			1		04/03/19 10:40		
Well Locked	No			1		04/03/19 10:40		
Purge Method	Dual Whale pump			1		04/03/19 10:40		
Total Well Depth	35.18	feet		1		04/03/19 10:40		
Depth of Water	15.07			1		04/03/19 10:40		
Well Volume Purged	11.25			1		04/03/19 10:40		
Purge Rate	1.25			1		04/03/19 10:40		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	74.4	mg/L	12.0	10		04/05/19 04:42	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	0.012	mg/L	0.010	1		04/03/19 16:06		FS
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.015	mg/L	0.010	1		04/10/19 16:18		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	18.7	mg/L	0.55	5	04/09/19 08:29	04/09/19 12:52	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	44.8	ug/L	20.0	1	04/15/19 11:21	04/16/19 08:48	57-12-5	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834661	Lab ID: 10469389003	Collected: 04/03/19 11:35	Received: 04/03/19 14:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:06	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	58	%	30-125	1	04/04/19 17:38	04/08/19 11:06	877-09-8	
Decachlorobiphenyl (S)	32	%	30-125	1	04/04/19 17:38	04/08/19 11:06	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	04/08/19 05:43	04/08/19 14:59	7429-90-5	
Barium, Dissolved	440	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:59	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:59	7440-50-8	
Manganese, Dissolved	414	ug/L	5.0	1	04/08/19 05:43	04/08/19 14:59	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 14:59	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 14:59	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/08/19 05:43	04/08/19 14:59	7440-31-5	
Total Hardness by 2340B, Dissolved	560000	ug/L	3300	1	04/08/19 05:43	04/08/19 14:59		
Zinc, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 14:59	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:33	7440-36-0	
Arsenic, Dissolved	1.2	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:33	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/08/19 05:43	04/08/19 18:33	7440-41-7	
Boron, Dissolved	9800	ug/L	1000	100	04/08/19 05:43	04/09/19 18:56	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/08/19 05:43	04/08/19 18:33	7440-43-9	
Chromium, Dissolved	4.2	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:33	7440-47-3	
Cobalt, Dissolved	0.67	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:33	7440-48-4	
Lead, Dissolved	0.25	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:33	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:33	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:33	7440-28-0	
Uranium-238, Dissolved	0.90	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:33	7440-61-1	
Vanadium, Dissolved	2.0	ug/L	1.0	1	04/08/19 05:43	04/08/19 18:33	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	83-32-9	
Anthracene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	50-32-8	
Benzoic acid	ND	ug/L	49.0	1	04/04/19 16:18	04/08/19 17:05	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	111-44-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834661 **Lab ID: 10469389003** Collected: 04/03/19 11:35 Received: 04/03/19 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.0	1	04/04/19 16:18	04/08/19 17:05	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	206-44-0	
Fluorene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.0	1	04/04/19 16:18	04/08/19 17:05	77-47-4	
Hexachloroethane	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	67-72-1	
Isophorone	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.6	1	04/04/19 16:18	04/08/19 17:05		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	62-75-9	
Pentachlorophenol	ND	ug/L	19.6	1	04/04/19 16:18	04/08/19 17:05	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	85-01-8	
Phenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	108-95-2	
Pyrene	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	04/04/19 16:18	04/08/19 17:05	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	80	%.	55-125	1	04/04/19 16:18	04/08/19 17:05	4165-60-0	
2-Fluorobiphenyl (S)	79	%.	52-125	1	04/04/19 16:18	04/08/19 17:05	321-60-8	
p-Terphenyl-d14 (S)	74	%.	57-125	1	04/04/19 16:18	04/08/19 17:05	1718-51-0	
Phenol-d6 (S)	78	%.	30-125	1	04/04/19 16:18	04/08/19 17:05	13127-88-3	
2-Fluorophenol (S)	76	%.	30-125	1	04/04/19 16:18	04/08/19 17:05	367-12-4	
2,4,6-Tribromophenol (S)	90	%.	52-125	1	04/04/19 16:18	04/08/19 17:05	118-79-6	

Field Data

Analytical Method:

Collected Date	04/03/19			1		04/03/19 11:35		
Collected Time	1135			1		04/03/19 11:35		
Field pH	6.7	Std. Units		1		04/03/19 11:35		
Field Temperature	10.0	deg C		1		04/03/19 11:35		
Field Specific Conductance	1450	umhos/cm		1		04/03/19 11:35		
Oxygen, Dissolved	1.0	mg/L		1		04/03/19 11:35	7782-44-7	
REDOX	-93	mV		1		04/03/19 11:35		
Turbidity	9.9	NTU		1		04/03/19 11:35		
Apparent Color	Slightly Cloudy			1		04/03/19 11:35		
Odor	No			1		04/03/19 11:35		
Well Locked	No			1		04/03/19 11:35		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834661		Lab ID: 10469389003		Collected: 04/03/19 11:35	Received: 04/03/19 14:35	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Purge Method	Dual Whale pump			1		04/03/19 11:35		
Total Well Depth	38.03	feet		1		04/03/19 11:35		
Depth of Water	17.43			1		04/03/19 11:35		
Well Volume Purged	11.25			1		04/03/19 11:35		
Purge Rate	1.25			1		04/03/19 11:35		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	44.6	mg/L	1.2	1		04/05/19 00:37	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/03/19 16:06		FS
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	0.019	mg/L	0.010	1		04/10/19 16:26		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	20.2	mg/L	0.55	5	04/09/19 08:29	04/09/19 12:55	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/15/19 11:21	04/16/19 08:49	57-12-5	

Sample: FB-2		Lab ID: 10469389004		Collected: 04/03/19 12:30	Received: 04/03/19 14:35	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.097	1	04/04/19 17:38	04/08/19 11:21	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	45	%	30-125	1	04/04/19 17:38	04/08/19 11:21	877-09-8	
Decachlorobiphenyl (S)	46	%	30-125	1	04/04/19 17:38	04/08/19 11:21	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/08/19 05:43	04/08/19 15:01	7429-90-5	
Barium, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 15:01	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 15:01	7440-50-8	
Manganese, Dissolved	ND	ug/L	5.0	1	04/08/19 05:43	04/08/19 15:01	7439-96-5	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: FB-2		Lab ID: 10469389004	Collected: 04/03/19 12:30	Received: 04/03/19 14:35	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Nickel, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 15:01	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 15:01	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/08/19 05:43	04/08/19 15:01	7440-31-5	
Total Hardness by 2340B, Dissolved	ND	ug/L	3300	1	04/08/19 05:43	04/08/19 15:01		
Zinc, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 15:01	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:39	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:39	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/08/19 05:43	04/08/19 18:39	7440-41-7	
Boron, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/09/19 18:37	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/08/19 05:43	04/08/19 18:39	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:39	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:39	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:39	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:39	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:39	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:39	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/08/19 05:43	04/08/19 18:39	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	83-32-9	
Anthracene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	50-32-8	
Benzoic acid	ND	ug/L	48.1	1	04/04/19 16:18	04/08/19 17:30	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	111-44-4	
2-Chlorophenol	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.1	1	04/04/19 16:18	04/08/19 17:30	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	120-83-2	
Diethylphthalate	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	105-67-9	
Dimethylphthalate	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	117-81-7	
Fluoranthene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	206-44-0	
Fluorene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	86-73-7	
Hexachlorobenzene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.1	1	04/04/19 16:18	04/08/19 17:30	77-47-4	
Hexachloroethane	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	67-72-1	
Isophorone	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	95-48-7	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: FB-2	Lab ID: 10469389004	Collected: 04/03/19 12:30	Received: 04/03/19 14:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.2	1	04/04/19 16:18	04/08/19 17:30		
N-Nitrosodimethylamine	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	62-75-9	
Pentachlorophenol	ND	ug/L	19.2	1	04/04/19 16:18	04/08/19 17:30	87-86-5	
Phenanthrene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	85-01-8	
Phenol	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	108-95-2	
Pyrene	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.6	1	04/04/19 16:18	04/08/19 17:30	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	60	%	55-125	1	04/04/19 16:18	04/08/19 17:30	4165-60-0	
2-Fluorobiphenyl (S)	57	%	52-125	1	04/04/19 16:18	04/08/19 17:30	321-60-8	
p-Terphenyl-d14 (S)	63	%	57-125	1	04/04/19 16:18	04/08/19 17:30	1718-51-0	
Phenol-d6 (S)	57	%	30-125	1	04/04/19 16:18	04/08/19 17:30	13127-88-3	
2-Fluorophenol (S)	56	%	30-125	1	04/04/19 16:18	04/08/19 17:30	367-12-4	
2,4,6-Tribromophenol (S)	70	%	52-125	1	04/04/19 16:18	04/08/19 17:30	118-79-6	
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	ND	mg/L	1.2	1		04/05/19 04:07	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		04/03/19 16:06		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	ND	mg/L	0.11	1	04/09/19 08:29	04/09/19 12:42	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/15/19 11:21	04/16/19 08:51	57-12-5	

Sample: 834660	Lab ID: 10469389005	Collected: 04/03/19 13:30	Received: 04/03/19 14:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	04/04/19 17:38	04/08/19 11:36	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	57	%	30-125	1	04/04/19 17:38	04/08/19 11:36	877-09-8	
Decachlorobiphenyl (S)	75	%	30-125	1	04/04/19 17:38	04/08/19 11:36	2051-24-3	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834660	Lab ID: 10469389005	Collected: 04/03/19 13:30	Received: 04/03/19 14:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/08/19 05:43	04/08/19 15:03	7429-90-5	
Barium, Dissolved	54.4	ug/L	10.0	1	04/08/19 05:43	04/08/19 15:03	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 15:03	7440-50-8	
Manganese, Dissolved	604	ug/L	5.0	1	04/08/19 05:43	04/08/19 15:03	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 15:03	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/08/19 05:43	04/08/19 15:03	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/08/19 05:43	04/08/19 15:03	7440-31-5	
Total Hardness by 2340B, Dissolved	506000	ug/L	3300	1	04/08/19 05:43	04/08/19 15:03		
Zinc, Dissolved	ND	ug/L	20.0	1	04/08/19 05:43	04/08/19 15:03	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	3.6	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:45	7440-36-0	
Arsenic, Dissolved	6.3	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:45	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/08/19 05:43	04/08/19 18:45	7440-41-7	
Boron, Dissolved	18700	ug/L	2000	200	04/08/19 05:43	04/09/19 18:59	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/08/19 05:43	04/08/19 18:45	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:45	7440-47-3	
Cobalt, Dissolved	1.2	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:45	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:45	7439-92-1	
Selenium, Dissolved	19.0	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:45	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	04/08/19 05:43	04/08/19 18:45	7440-28-0	
Uranium-238, Dissolved	10.4	ug/L	0.50	1	04/08/19 05:43	04/08/19 18:45	7440-61-1	
Vanadium, Dissolved	8.1	ug/L	1.0	1	04/08/19 05:43	04/08/19 18:45	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	83-32-9	
Anthracene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	50-32-8	
Benzoic acid	ND	ug/L	49.3	1	04/04/19 16:18	04/08/19 17:55	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	111-44-4	
2-Chlorophenol	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.3	1	04/04/19 16:18	04/08/19 17:55	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	120-83-2	
Diethylphthalate	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	105-67-9	
Dimethylphthalate	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	117-81-7	
Fluoranthene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	206-44-0	
Fluorene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	86-73-7	
Hexachlorobenzene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.3	1	04/04/19 16:18	04/08/19 17:55	77-47-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834660	Lab ID: 10469389005	Collected: 04/03/19 13:30	Received: 04/03/19 14:35	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Hexachloroethane	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	67-72-1	
Isophorone	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.7	1	04/04/19 16:18	04/08/19 17:55		
N-Nitrosodimethylamine	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	62-75-9	
Pentachlorophenol	ND	ug/L	19.7	1	04/04/19 16:18	04/08/19 17:55	87-86-5	
Phenanthrene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	85-01-8	
Phenol	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	108-95-2	
Pyrene	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.9	1	04/04/19 16:18	04/08/19 17:55	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	70	%.	55-125	1	04/04/19 16:18	04/08/19 17:55	4165-60-0	
2-Fluorobiphenyl (S)	71	%.	52-125	1	04/04/19 16:18	04/08/19 17:55	321-60-8	
p-Terphenyl-d14 (S)	73	%.	57-125	1	04/04/19 16:18	04/08/19 17:55	1718-51-0	
Phenol-d6 (S)	68	%.	30-125	1	04/04/19 16:18	04/08/19 17:55	13127-88-3	
2-Fluorophenol (S)	68	%.	30-125	1	04/04/19 16:18	04/08/19 17:55	367-12-4	
2,4,6-Tribromophenol (S)	85	%.	52-125	1	04/04/19 16:18	04/08/19 17:55	118-79-6	
Field Data								
Analytical Method:								
Collected Date	04/03/19			1		04/03/19 13:30		
Collected Time	1330			1		04/03/19 13:30		
Field pH	7.4	Std. Units		1		04/03/19 13:30		
Field Temperature	9.5	deg C		1		04/03/19 13:30		
Field Specific Conductance	1140	umhos/cm		1		04/03/19 13:30		
Oxygen, Dissolved	3.7	mg/L		1		04/03/19 13:30	7782-44-7	
REDOX	-30	mV		1		04/03/19 13:30		
Turbidity	114	NTU		1		04/03/19 13:30		
Apparent Color	Slightly Cloudy			1		04/03/19 13:30		
Odor	No			1		04/03/19 13:30		
Well Locked	No			1		04/03/19 13:30		
Purge Method	Peristaltic pump			1		04/03/19 13:30		
Total Well Depth	20.29	feet		1		04/03/19 13:30		
Depth of Water	11.64			1		04/03/19 13:30		
Well Volume Purged	4.5			1		04/03/19 13:30		
Purge Rate	1.25/0.15			1		04/03/19 13:30		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	25.0	mg/L	1.2	1		04/05/19 00:52	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		04/03/19 16:06		FS,M1
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		04/10/19 16:34		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834660	Lab ID: 10469389005	Collected: 04/03/19 13:30		Received: 04/03/19 14:35		Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	0.40	mg/L	0.11	1	04/09/19 08:29	04/09/19 12:44	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/15/19 11:21	04/16/19 08:53	57-12-5	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

QC Batch: 597783 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 3232443 Matrix: Water
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/08/19 14:35	
Barium, Dissolved	ug/L	ND	10.0	04/08/19 14:35	
Copper, Dissolved	ug/L	ND	10.0	04/08/19 14:35	
Manganese, Dissolved	ug/L	ND	5.0	04/08/19 14:35	
Nickel, Dissolved	ug/L	ND	20.0	04/08/19 14:35	
Silver, Dissolved	ug/L	ND	10.0	04/08/19 14:35	
Tin, Dissolved	ug/L	ND	75.0	04/08/19 14:35	
Zinc, Dissolved	ug/L	ND	20.0	04/08/19 14:35	

LABORATORY CONTROL SAMPLE: 3232444

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21300	106	85-115	
Barium, Dissolved	ug/L	1000	1030	103	85-115	
Copper, Dissolved	ug/L	1000	977	98	85-115	
Manganese, Dissolved	ug/L	1000	1040	104	85-115	
Nickel, Dissolved	ug/L	1000	1010	101	85-115	
Silver, Dissolved	ug/L	500	509	102	85-115	
Tin, Dissolved	ug/L	1000	1030	103	85-115	
Zinc, Dissolved	ug/L	1000	1020	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3232445 3232446

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10469416002 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Aluminum, Dissolved	ug/L	ND	20000	20000	22600	22700	113	113	70-130	0	20
Barium, Dissolved	ug/L	515	1000	1000	1570	1560	105	105	70-130	0	20
Copper, Dissolved	ug/L	ND	1000	1000	1060	1060	106	106	70-130	0	20
Manganese, Dissolved	ug/L	494	1000	1000	1550	1540	106	104	70-130	1	20
Nickel, Dissolved	ug/L	ND	1000	1000	1000	996	100	99	70-130	1	20
Silver, Dissolved	ug/L	ND	500	500	553	553	111	111	70-130	0	20
Tin, Dissolved	ug/L	ND	1000	1000	1020	1010	102	100	70-130	2	20
Zinc, Dissolved	ug/L	ND	1000	1000	992	984	99	98	70-130	1	20

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

QC Batch: 597782 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
 Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 3232439 Matrix: Water
 Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/08/19 17:24	
Arsenic, Dissolved	ug/L	ND	0.50	04/08/19 17:24	
Beryllium, Dissolved	ug/L	ND	0.20	04/08/19 17:24	
Boron, Dissolved	ug/L	ND	10.0	04/08/19 17:24	
Cadmium, Dissolved	ug/L	ND	0.080	04/08/19 17:24	
Chromium, Dissolved	ug/L	ND	0.50	04/08/19 17:24	
Cobalt, Dissolved	ug/L	ND	0.50	04/08/19 17:24	
Lead, Dissolved	ug/L	ND	0.10	04/08/19 17:24	
Selenium, Dissolved	ug/L	ND	0.50	04/08/19 17:24	
Thallium, Dissolved	ug/L	ND	0.10	04/08/19 17:24	
Uranium-238, Dissolved	ug/L	ND	0.50	04/08/19 17:24	
Vanadium, Dissolved	ug/L	ND	1.0	04/08/19 17:24	

LABORATORY CONTROL SAMPLE: 3232440

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	99.7	100	85-115	
Arsenic, Dissolved	ug/L	100	98.0	98	85-115	
Beryllium, Dissolved	ug/L	100	103	103	85-115	
Boron, Dissolved	ug/L	100	101	101	85-115	
Cadmium, Dissolved	ug/L	100	103	103	85-115	
Chromium, Dissolved	ug/L	100	107	107	85-115	
Cobalt, Dissolved	ug/L	100	106	106	85-115	
Lead, Dissolved	ug/L	100	108	108	85-115	
Selenium, Dissolved	ug/L	100	103	103	85-115	
Thallium, Dissolved	ug/L	100	107	107	85-115	
Uranium-238, Dissolved	ug/L	100	102	102	85-115	
Vanadium, Dissolved	ug/L	100	106	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3232441 3232442

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10469416001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony, Dissolved	ug/L	ND	100	100	105	102	105	102	70-130	3	20	
Arsenic, Dissolved	ug/L	0.75	100	100	102	105	102	104	70-130	3	20	
Beryllium, Dissolved	ug/L	ND	100	100	98.2	102	98	102	70-130	3	20	
Boron, Dissolved	ug/L	20200	100	100	21100	21800	822	1570	70-130	3	20	M6
Cadmium, Dissolved	ug/L	ND	100	100	104	106	104	106	70-130	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Parameter	Units	10469416001		3232441		3232442		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec								
Chromium, Dissolved	ug/L	0.52	100	100	107	108	106	108	70-130	1	20				
Cobalt, Dissolved	ug/L	0.91	100	100	103	106	102	105	70-130	3	20				
Lead, Dissolved	ug/L	ND	100	100	103	105	103	105	70-130	1	20				
Selenium, Dissolved	ug/L	6.9	100	100	109	113	102	106	70-130	4	20				
Thallium, Dissolved	ug/L	ND	100	100	103	103	103	103	70-130	0	20				
Uranium-238, Dissolved	ug/L	9.3	100	100	115	117	106	108	70-130	2	20				
Vanadium, Dissolved	ug/L	1.7	100	100	110	112	109	110	70-130	1	20				

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

QC Batch: 597661 Analysis Method: EPA 8082A
 QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
 Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 3231801 Matrix: Water
 Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/08/19 10:05	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/08/19 10:05	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/08/19 10:05	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/08/19 10:05	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/08/19 10:05	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/08/19 10:05	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/08/19 10:05	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/08/19 10:05	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/08/19 10:05	
Decachlorobiphenyl (S)	%	84	30-125	04/08/19 10:05	
Tetrachloro-m-xylene (S)	%	58	30-125	04/08/19 10:05	

LABORATORY CONTROL SAMPLE & LCSD: 3231802

Parameter	Units	3231802		3231803		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec				
PCB-1016 (Aroclor 1016)	ug/L	2	1.4	1.6	69	78	45-125	12	20
PCB-1260 (Aroclor 1260)	ug/L	2	1.6	1.7	78	86	49-125	11	20
Decachlorobiphenyl (S)	%				81	90	30-125		
Tetrachloro-m-xylene (S)	%				58	65	30-125		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

QC Batch: 597687 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 3231843 Matrix: Water
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/08/19 13:46	
2,4-Dichlorophenol	ug/L	ND	10.0	04/08/19 13:46	
2,4-Dimethylphenol	ug/L	ND	10.0	04/08/19 13:46	
2,4-Dinitrophenol	ug/L	ND	10.0	04/08/19 13:46	
2-Chlorophenol	ug/L	ND	10.0	04/08/19 13:46	
2-Methylnaphthalene	ug/L	ND	10.0	04/08/19 13:46	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/08/19 13:46	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/08/19 13:46	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/08/19 13:46	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/08/19 13:46	
Acenaphthene	ug/L	ND	10.0	04/08/19 13:46	
Anthracene	ug/L	ND	10.0	04/08/19 13:46	
Benzo(a)pyrene	ug/L	ND	10.0	04/08/19 13:46	
Benzoic acid	ug/L	ND	50.0	04/08/19 13:46	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/08/19 13:46	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/08/19 13:46	
Butylbenzylphthalate	ug/L	ND	10.0	04/08/19 13:46	
Di-n-butylphthalate	ug/L	ND	10.0	04/08/19 13:46	
Di-n-octylphthalate	ug/L	ND	10.0	04/08/19 13:46	
Diethylphthalate	ug/L	ND	10.0	04/08/19 13:46	
Dimethylphthalate	ug/L	ND	10.0	04/08/19 13:46	
Fluoranthene	ug/L	ND	10.0	04/08/19 13:46	
Fluorene	ug/L	ND	10.0	04/08/19 13:46	
Hexachlorobenzene	ug/L	ND	10.0	04/08/19 13:46	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/08/19 13:46	
Hexachloroethane	ug/L	ND	10.0	04/08/19 13:46	
Isophorone	ug/L	ND	10.0	04/08/19 13:46	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/08/19 13:46	
Pentachlorophenol	ug/L	ND	20.0	04/08/19 13:46	
Phenanthrene	ug/L	ND	10.0	04/08/19 13:46	
Phenol	ug/L	ND	10.0	04/08/19 13:46	
Pyrene	ug/L	ND	10.0	04/08/19 13:46	
2,4,6-Tribromophenol (S)	%	80	52-125	04/08/19 13:46	
2-Fluorobiphenyl (S)	%	71	52-125	04/08/19 13:46	
2-Fluorophenol (S)	%	71	30-125	04/08/19 13:46	
Nitrobenzene-d5 (S)	%	76	55-125	04/08/19 13:46	
p-Terphenyl-d14 (S)	%	74	57-125	04/08/19 13:46	
Phenol-d6 (S)	%	72	30-125	04/08/19 13:46	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

LABORATORY CONTROL SAMPLE & LCSD: 3231844		3231845								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	40.8	36.1	82	72	60-125	12	20	
2,4-Dichlorophenol	ug/L	50	40.3	36.2	81	72	56-125	11	20	
2,4-Dimethylphenol	ug/L	50	33.7	32.5	67	65	33-125	4	20	
2,4-Dinitrophenol	ug/L	50	27.2	22.8	54	46	32-125	17	20	1M
2-Chlorophenol	ug/L	50	40.2	35.6	80	71	52-125	12	20	
2-Methylnaphthalene	ug/L	50	40.2	35.9	80	72	52-125	12	20	
2-Methylphenol(o-Cresol)	ug/L	50	38.8	34.9	78	70	55-125	10	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	39.1	34.3	78	69	57-125	13	20	
3,3'-Dichlorobenzidine	ug/L	50	39.1J	33.4J	78	67	39-150		20	
4-Bromophenylphenyl ether	ug/L	50	40.1	35.6	80	71	61-125	12	20	
Acenaphthene	ug/L	50	40.7	36.7	81	73	59-125	10	20	
Anthracene	ug/L	50	42.1	36.8	84	74	64-125	14	20	
Benzo(a)pyrene	ug/L	50	39.0	33.4	78	67	63-125	15	20	
Benzoic acid	ug/L	50	23.7J	20.5J	47	41	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	37.9	34.2	76	68	49-125	10	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	40.4	36.2	81	72	68-125	11	20	
Butylbenzylphthalate	ug/L	50	39.9	34.5	80	69	67-125	14	20	
Di-n-butylphthalate	ug/L	50	44.5	37.9	89	76	67-125	16	20	
Di-n-octylphthalate	ug/L	50	40.2	36.0	80	72	67-125	11	20	
Diethylphthalate	ug/L	50	42.6	37.7	85	75	64-125	12	20	
Dimethylphthalate	ug/L	50	42.1	37.5	84	75	65-125	12	20	
Fluoranthene	ug/L	50	42.9	36.4	86	73	64-125	16	20	
Fluorene	ug/L	50	41.1	36.8	82	74	63-125	11	20	
Hexachlorobenzene	ug/L	50	44.2	38.2	88	76	61-125	15	20	
Hexachlorocyclopentadiene	ug/L	50	22.5J	ND	45	40	30-125		20	
Hexachloroethane	ug/L	50	38.8	35.3	78	71	30-125	10	20	
Isophorone	ug/L	50	40.3	35.8	81	72	59-125	12	20	
N-Nitrosodimethylamine	ug/L	50	38.6	34.3	77	69	43-125	12	20	
Pentachlorophenol	ug/L	50	31.1	26.9	62	54	35-125	14	20	
Phenanthrene	ug/L	50	41.9	36.4	84	73	65-125	14	20	
Phenol	ug/L	50	39.5	34.6	79	69	54-125	13	20	
Pyrene	ug/L	50	39.6	34.2	79	68	65-125	15	20	
2,4,6-Tribromophenol (S)	%				91	77	52-125			
2-Fluorobiphenyl (S)	%				79	72	52-125			
2-Fluorophenol (S)	%				79	69	30-125			
Nitrobenzene-d5 (S)	%				81	73	55-125			
p-Terphenyl-d14 (S)	%				76	66	57-125			
Phenol-d6 (S)	%				79	70	30-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469389

QC Batch: 597704 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 3231898 Matrix: Water
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/04/19 07:03	

LABORATORY CONTROL SAMPLE: 3231899

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.7	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3231900 3231901

Parameter	Units	10469416001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chloride	mg/L	37.6	125	125	153	152	92	92	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3231902 3231903

Parameter	Units	10469416002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chloride	mg/L	72.3	125	125	189	188	93	92	90-110	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

QC Batch: 597501

Analysis Method: SM 3500-Cr B Modified

QC Batch Method: SM 3500-Cr B Modified

Analysis Description: Chromium, Hexavalent by 3500

Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 3230800

Matrix: Water

Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/03/19 16:06	FS

LABORATORY CONTROL SAMPLE: 3230801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	97	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3230802 3230803

Parameter	Units	3230802		3230803		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10469389005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium, Hexavalent	mg/L	ND	0.2	0.2	0.14	0.15	68	71	85-115	4	20 FS,M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10469389

QC Batch: 163940 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 646074 Matrix: Water
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	04/09/19 12:02	

LABORATORY CONTROL SAMPLE: 646075

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 646076 646077

Parameter	Units	12123225001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.15	5	5	5.4	5.3	104	104	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 646078 646079

Parameter	Units	12123229002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	5.3	5.3	105	104	90-110	0	10	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

QC Batch: 599418 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 3240961 Matrix: Water
Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/15/19 17:31	

LABORATORY CONTROL SAMPLE: 3240962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	273	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3240963 3240964

Parameter	Units	10469117004 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	21.9	250	250	235	244	85	89	80-120	4	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3240965 3240966

Parameter	Units	10469593001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Cyanide	ug/L	<8.5	250	250	263	237	102	92	80-120	10	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Sample: 834662 **Lab ID: 10469389001** Collected: 04/03/19 09:20 Received: 04/03/19 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	16.3 ± 4.95 (4.59) C:NA T:NA	pCi/L	04/15/19 18:14	12587-46-1	
Gross Beta	EPA 900.0	58.0 ± 10.9 (2.74) C:NA T:NA	pCi/L	04/15/19 18:14	12587-47-2	

Sample: 834663 **Lab ID: 10469389002** Collected: 04/03/19 10:40 Received: 04/03/19 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	7.74 ± 3.32 (3.98) C:NA T:NA	pCi/L	04/15/19 18:50	12587-46-1	
Gross Beta	EPA 900.0	57.9 ± 10.9 (2.99) C:NA T:NA	pCi/L	04/15/19 18:50	12587-47-2	

Sample: 834661 **Lab ID: 10469389003** Collected: 04/03/19 11:35 Received: 04/03/19 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	4.18 ± 1.95 (2.54) C:NA T:NA	pCi/L	04/15/19 18:15	12587-46-1	
Gross Beta	EPA 900.0	33.3 ± 6.24 (1.51) C:NA T:NA	pCi/L	04/15/19 18:15	12587-47-2	

Sample: FB-2 **Lab ID: 10469389004** Collected: 04/03/19 12:30 Received: 04/03/19 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	0.572 ± 0.667 (1.25) C:NA T:NA	pCi/L	04/11/19 08:13	12587-46-1	
Gross Beta	EPA 900.0	-0.042 ± 0.564 (1.40) C:NA T:NA	pCi/L	04/11/19 08:13	12587-47-2	

Sample: 834660 **Lab ID: 10469389005** Collected: 04/03/19 13:30 Received: 04/03/19 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	10.6 ± 3.61 (2.99) C:NA T:NA	pCi/L	04/11/19 08:11	12587-46-1	
Gross Beta	EPA 900.0	23.7 ± 4.85 (2.25) C:NA T:NA	pCi/L	04/11/19 08:11	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

QC Batch: 337355 Analysis Method: EPA 900.0
 QC Batch Method: EPA 900.0 Analysis Description: 900.0 Gross Alpha/Beta
 Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

METHOD BLANK: 1641975 Matrix: Water
 Associated Lab Samples: 10469389001, 10469389002, 10469389003, 10469389004, 10469389005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.003 ± 0.364 (1.10) C:NA T:NA	pCi/L	04/11/19 08:11	
Gross Beta	-0.024 ± 0.814 (2.01) C:NA T:NA	pCi/L	04/11/19 08:11	

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10469389

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 598122

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

ANALYTE QUALIFIERS

- 1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value
- FS The sample was filtered in the laboratory prior to analysis.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10469389001	834662	EPA Mod. 3510C	597661	EPA 8082A	598122
10469389002	834663	EPA Mod. 3510C	597661	EPA 8082A	598122
10469389003	834661	EPA Mod. 3510C	597661	EPA 8082A	598122
10469389004	FB-2	EPA Mod. 3510C	597661	EPA 8082A	598122
10469389005	834660	EPA Mod. 3510C	597661	EPA 8082A	598122
10469389001	834662	EPA 200.7	597783	EPA 200.7	598200
10469389002	834663	EPA 200.7	597783	EPA 200.7	598200
10469389003	834661	EPA 200.7	597783	EPA 200.7	598200
10469389004	FB-2	EPA 200.7	597783	EPA 200.7	598200
10469389005	834660	EPA 200.7	597783	EPA 200.7	598200
10469389001	834662	EPA 200.8	597782	EPA 200.8	598167
10469389002	834663	EPA 200.8	597782	EPA 200.8	598167
10469389003	834661	EPA 200.8	597782	EPA 200.8	598167
10469389004	FB-2	EPA 200.8	597782	EPA 200.8	598167
10469389005	834660	EPA 200.8	597782	EPA 200.8	598167
10469389001	834662	EPA 3520	597687	EPA 8270D	598133
10469389002	834663	EPA 3520	597687	EPA 8270D	598133
10469389003	834661	EPA 3520	597687	EPA 8270D	598133
10469389004	FB-2	EPA 3520	597687	EPA 8270D	598133
10469389005	834660	EPA 3520	597687	EPA 8270D	598133
10469389001	834662				
10469389002	834663				
10469389003	834661				
10469389005	834660				
10469389001	834662	EPA 900.0	337355		
10469389002	834663	EPA 900.0	337355		
10469389003	834661	EPA 900.0	337355		
10469389004	FB-2	EPA 900.0	337355		
10469389005	834660	EPA 900.0	337355		
10469389001	834662	EPA 300.0	597704		
10469389002	834663	EPA 300.0	597704		
10469389003	834661	EPA 300.0	597704		
10469389004	FB-2	EPA 300.0	597704		
10469389005	834660	EPA 300.0	597704		
10469389001	834662	SM 3500-Cr B Modified	597501		
10469389002	834663	SM 3500-Cr B Modified	597501		
10469389003	834661	SM 3500-Cr B Modified	597501		
10469389004	FB-2	SM 3500-Cr B Modified	597501		
10469389005	834660	SM 3500-Cr B Modified	597501		
10469389001	834662	EPA 350.1			
10469389002	834663	EPA 350.1			
10469389003	834661	EPA 350.1			
10469389005	834660	EPA 350.1			
10469389001	834662	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10469389

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10469389002	834663	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10469389003	834661	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10469389004	FB-2	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10469389005	834660	EPA 350.1 rev. 2 (1993)	163940	EPA 350.1 rev. 2 (1993)	163958
10469389001	834662	SM 4500-CN-E	599418	SM 4500-CN-E	599555
10469389002	834663	SM 4500-CN-E	599418	SM 4500-CN-E	599555
10469389003	834661	SM 4500-CN-E	599418	SM 4500-CN-E	599555
10469389004	FB-2	SM 4500-CN-E	599418	SM 4500-CN-E	599555
10469389005	834660	SM 4500-CN-E	599418	SM 4500-CN-E	599555

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WO#: 10469389



10469389



Minnesota Pollution Control Agency

Chain-of-Custody Form revision 2013.0909

Work Order Number: CC

Turnaround Time:

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MNSW-057	Program Code (MDH Lab Only):	Lab Name: Pace Analytical - Minneapolis, MN
Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters	Project Task Code: PRJ07786	Address: 1700 SE Elm Street
Project Manager: Brad Jacobson 612-607-6375	EPIC PROFILE #: 38716 Line 2	Minneapolis MN 55414
Potential Hazard? If yes, add information to Sampler Comments Section		Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				PRESERV.	ANALYSIS	Lab Sample No.	#				
Sample=Routine Sample	QC-FB=Field Blank Sample	QC-FR=Field Replicate Sample	QC-TB=Trip Blank Sample	DW=Drinking Water	AR=Air	NW=Non-potable Water	BL=Biological Material	Wtr-Ground=Groundwater	Wtr-Surf=Surface Water	QC-BLANK=Artificial Blank Water	Leachate=Leachate Sample								
S-IVP=Integrated Vertical Profile Sample				SD=Soil/Solid	OT=Other	WP=Wipe	TS=Tissue												
S-CWOP=Composite Sample																			
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/ Unionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SVOC, 8082, MDA1, MDA2 - QAPP Table 3a	Lab Sample No.	#
834662	sample	4/3/19	0920			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	001	1
834663	sample	4/3/19	1040			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	002	2
834661	sample	4/3/19	1135			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	003	3
FB-2	QC-FB	4/3/19	1230			G	NW	QC-Trip Blank	N		14	X	X	X	X	X	X	004	4
834660	sample	4/3/19	1320			G	NW	Wtr-Ground	N		14	X	X	X	X	X	X	005	5
									N										6
									N										7
									N										8
									N										9
									N										10

DATA 4/3/19

Sampled By: *David Anderson / Chris Pelosi* Sampler's Signature: *David Anderson* Phone #:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) <i>David Anderson / Pace Analytical</i>	<i>4/3/19 / 1430</i>	<i>[Signature]</i>	<i>4/3/19 1435</i>

T = 6.2, 14.0, 2.6, 12.8, 9.7

Sample Condition Upon Receipt

Client Name:

Project #:

WO# 10469389
 PM: JMA Due Date: 04/10/19
 CLIENT: PAST-MINFLD

Courier:

- Fed Ex UPS USPS Client
 Pace Speedee Commercial See Exception

Tracking Number:

Custody Seal on Cooler/Box Present? Yes No

Seals Intact? Yes No

Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other:

Temp Blank? Yes No

Thermometer: G87A9155100842 G87A9170600254 Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>6.2, 14.0, 2.6, 12.8, 9.7</u> °C	Average Corrected Temp (no temp blank only): <input type="checkbox"/>
Correction Factor: <u>None</u>	Cooler Temp Corrected w/temp blank: <u>6.2, 14.0, 2.6, 12.8, 9.7</u> °C	See Exceptions <input type="checkbox"/>

USDA Regulated Soil: (N/A, water sample/Other: _____)

Date/Initials of Person Examining Contents: JMA 4/13/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Flex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <u>JMA 4/13/19</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: <input type="checkbox"/> See Exception
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>1-5 2/2</u> <u>1-5 2/2</u> <u>1-5 5/2</u> <input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Chlorine? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> See Exception
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> See Exception
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased): <u>JMA</u>

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____

Date/Time: _____

Field Data Required? Yes No

Comments/Resolution: _____

Project Manager Review: JMA

Date: 04/03/2019

Note: Whenever there is a discrepancy involving North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: JMA



Document Name:
SCUR Exception Form – Coolers Above 6°C

Document Revised: 04Feb2019
Page 1 of 1

Document No.:
F-MN-C-298-Rev.01

Issuing Authority:
Pace Minnesota Quality Office

During sample triage, this form is to be placed in each cooler that arrives above 6.0 degrees Celsius

SCUR Exceptions:

Workorder #:

Out of Temp Sample IDs	Container Type	# of Containers	PM Notified? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																								
			If yes, indicate who was contacted/date/time. If no, indicate reason why. <i>Sample Sarcody</i>																								
			Multiple Cooler Project? <input type="checkbox"/> Yes <input type="checkbox"/> No If you answered yes, fill out information to the left.																								
			<table border="1"> <thead> <tr> <th colspan="3">No Temp Blank</th> </tr> <tr> <th>Read Temp</th> <th>Corrected Temp</th> <th>Average Temp</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	No Temp Blank			Read Temp	Corrected Temp	Average Temp																		
No Temp Blank																											
Read Temp	Corrected Temp	Average Temp																									

Other Issues

Issue Type:	Container Type	# of Containers
Sample ID		

Tracking Number

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preserv.	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance after addition?	Initials
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	
								<input type="checkbox"/> Yes <input type="checkbox"/> No	

Sample Condition Upon Receipt

Client Name: Pace MN Project #: **WO# : 12123316**
 Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____
 Tracking Number: _____



Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No
 Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun
 Cooler Temp Read °C: 2.3 Cooler Temp Corrected °C: 2.0 Biological Tissue Frozen? Yes No NA
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: RH 4/5/19

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>TW</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
 Project Manager Review: Katie Richards Date: 4/5/2019
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)


Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN
 Cert. Needed: Yes No



Workorder: 10469389 Workorder Name: 19-01567 MPCA Freeway LF 19 WT Owner Received Date: 4/3/2019 Results Requested By: 4/24/2019

Report To		Subcontract To				Requested Analysis										
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600				<div style="border: 1px solid black; padding: 5px; display: inline-block;"> WO# : 30287914  30287914 </div>										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	LAB USE ONLY					
						HNO3	RP1N									
1	834662	PS	4/3/2019 09:20	10469389001	Water	1				X						001
2	834663	PS	4/3/2019 10:40	10469389002	Water	1				X						002
3	834661	PS	4/3/2019 11:35	10469389003	Water	1				X						003
4	FB-2	PS	4/3/2019 12:30	10469389004	Water	1				X						004
5	834660	PS	4/3/2019 13:30	10469389005	Water	1				X						005
Transfers											Comments					
Released By	Date/Time	Received By	Date/Time													
<i>[Signature]</i>	4/4/19 15:10	<i>[Signature]</i>	4/5/19 9:30													
Cooler Temperature on Receipt <i>N/A</i> °C		Custody Seal <input checked="" type="radio"/> Y or N			Received on Ice Y or <input checked="" type="radio"/> N			Samples Intact <input checked="" type="radio"/> Y or N								

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace - MN.

Project # 30287914

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4638 0195 7626

Label	<u>MG</u>
LIMS Login	<u>MG</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>1003581</u>	<u>MG 4/5/19</u>
Chain of Custody Present:	/				
Chain of Custody Filled Out:	/				
Chain of Custody Relinquished:	/				
Sampler Name & Signature on COC:	/				
Sample Labels match COC:	/				
-Includes date/time/ID Matrix: <u>MT</u>					
Samples Arrived within Hold Time:	/				
Short Hold Time Analysis (<72hr remaining):	/				
Rush Turn Around Time Requested:	/				
Sufficient Volume:	/				
Correct Containers Used:	/				
-Pace Containers Used:	/				
Containers Intact:	/				
Orthophosphate field filtered			/		
Hex Cr Aqueous Compliance/NPDES sample field filtered			/		
Organic Samples checked for dechlorination:			/		
Filtered volume received for Dissolved tests			/		
All containers have been checked for preservation.	/				
All containers needing preservation are found to be in compliance with EPA recommendation.	/				
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>MG</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/		
Trip Blank Present:			/		
Trip Blank Custody Seals Present			/		
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>MG</u>	Date: <u>4/5/19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



16-Apr-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10469389**

Work Order: **1904359**

Dear Jennifer,

ALS Environmental received 5 samples on 05-Apr-2019 08:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 11.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10469389
Work Order: 1904359

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1904359-01	834662	Water		4/3/2019 09:20	4/5/2019 08:30	<input type="checkbox"/>
1904359-02	834663	Water		4/3/2019 10:40	4/5/2019 08:30	<input type="checkbox"/>
1904359-03	834661	Water		4/3/2019 11:35	4/5/2019 08:30	<input type="checkbox"/>
1904359-04	FB-2	Water		4/3/2019 12:30	4/5/2019 08:30	<input type="checkbox"/>
1904359-05	834660	Water		4/3/2019 13:30	4/5/2019 08:30	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10469389
WorkOrder: 1904359

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 16-Apr-19

Client: Pace Analytical Services, LLC

Project: 10469389

Work Order: 1904359

Sample ID: 834662

Lab ID: 1904359-01

Collection Date: 4/3/2019 09:20 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/15/2019 10:15 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 16-Apr-19

Client: Pace Analytical Services, LLC

Project: 10469389

Work Order: 1904359

Sample ID: 834663

Lab ID: 1904359-02

Collection Date: 4/3/2019 10:40 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/15/2019 10:15 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 16-Apr-19

Client: Pace Analytical Services, LLC

Project: 10469389

Work Order: 1904359

Sample ID: 834661

Lab ID: 1904359-03

Collection Date: 4/3/2019 11:35 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/15/2019 10:15 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 16-Apr-19

Client: Pace Analytical Services, LLC

Project: 10469389

Work Order: 1904359

Sample ID: FB-2

Lab ID: 1904359-04

Collection Date: 4/3/2019 12:30 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/15/2019 10:15 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 16-Apr-19

Client: Pace Analytical Services, LLC

Project: 10469389

Work Order: 1904359

Sample ID: 834660

Lab ID: 1904359-05

Collection Date: 4/3/2019 01:30 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE Cyanide, Free	ND		SW9014 20	µg/L	1	Analyst: RZM 4/15/2019 10:15 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 1904359
Project: 10469389

QC BATCH REPORT

Batch ID: **R258491** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R258491-R258491				Units: µg/L		Analysis Date: 4/15/2019 10:15 AM		
Client ID:		Run ID: WETCHEM_190415G		SeqNo: 5606769		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free ND 20

LCS		Sample ID: LCS-R258491-R258491				Units: µg/L		Analysis Date: 4/15/2019 10:15 AM		
Client ID:		Run ID: WETCHEM_190415G		SeqNo: 5606770		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 262.2 20 250 0 105 81-119 0

MS		Sample ID: 1904419-13B MS				Units: µg/L		Analysis Date: 4/15/2019 10:15 AM		
Client ID:		Run ID: WETCHEM_190415G		SeqNo: 5606777		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free ND 20 250 -4.88 1.95 81-119 0 S

MSD		Sample ID: 1904419-13B MSD				Units: µg/L		Analysis Date: 4/15/2019 10:15 AM		
Client ID:		Run ID: WETCHEM_190415G		SeqNo: 5606778		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free ND 20 250 -4.88 1.95 81-119 -2.37 0 20 S

The following samples were analyzed in this batch:

1904359-01A	1904359-02A	1904359-03A
1904359-04A	1904359-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Chain of Custody

1904359



Workorder: 10469389

Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Results Requested By: 4/24/2019

Report / Invoice To		Subcontract To		Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436 Email: jennifer.anderson@pacelabs.com		ALS 3352 128th Avenue Holland, MI 49424		P.O. 10469389															
State of Sample Origin: MN				Preserved Containers								Free Cyanide							
Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Other BP3A														LAB USE ONLY
1	834662	4/3/2019 09:20	10469389001	Water	1														
2	834663	4/3/2019 10:40	10469389002	Water	1														
3	834661	4/3/2019 11:35	10469389003	Water	1														
4	FB-2	4/3/2019 12:30	10469389004	Water	1														
5	834660	4/3/2019 13:30	10469389005	Water	1														
Comments																			
Transfers	Released By	Date/Time	Received By	Date/Time															
1	<i>[Signature]</i>	4/14/19 1455																	
2																			
3																			
Cooler Temperature on Receipt °C		Custody Seal Y or N			Received on Ice Y or N				Samples Intact Y or N										

Min 4.5.19 8:30
MF 4.5.19 10:20
802
2.8C
PH 15

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **05-Apr-19 08:30**

Work Order: **1904359**

Received by: **BNF**

Checklist completed by *Lernina France* 05-Apr-19
eSignature Date

Reviewed by: *Chad Whilton* 05-Apr-19
eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition? Yes No Not Present

Custody seals intact on shipping container/cooler? Yes No Not Present

Custody seals intact on sample bottles? Yes No Not Present

Chain of custody present? Yes No

Chain of custody signed when relinquished and received? Yes No

Chain of custody agrees with sample labels? Yes No

Samples in proper container/bottle? Yes No

Sample containers intact? Yes No

Sufficient sample volume for indicated test? Yes No

All samples received within holding time? Yes No

Container/Temp Blank temperature in compliance? Yes No

Sample(s) received on ice? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 18, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/05/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2019
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2019
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
834662	A191415-01	Water	04/03/2019	04/05/2019
834663	A191415-02	Water	04/03/2019	04/05/2019
834661	A191415-03	Water	04/03/2019	04/05/2019
FB-2	A191415-04	Water	04/03/2019	04/05/2019
834660	A191415-05	Water	04/03/2019	04/05/2019

CASE NARRATIVE

Sample Receipt Information:

5 samples were received on 04/05/2019. Samples were received at 1.5 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for acetochlor and prometon for samples A191415-01 through A191415-05. Samples were less than the reporting limit for these analytes so no further action is required.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

834662

Date Sampled
04/03/2019 09:20

A191415-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904148

Acetochlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 05:51	EPA 8270D	
Surrogate: Atrazine-d5		98.3 %		56.9-123	04/05/2019	04/11/2019 05:51	EPA 8270D	
Surrogate: Parathion-d10		72.4 %		23.8-169	04/05/2019	04/11/2019 05:51	EPA 8270D	
Surrogate: Triphenyl phosphate		86.4 %		50.5-178	04/05/2019	04/11/2019 05:51	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904151

2,4-D	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:14	EPA 8151A	
Surrogate: 2,4-D-d5		90.2 %		44.2-121	04/08/2019	04/10/2019 04:14	EPA 8151A	

Pace Analytical
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Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

834663

A191415-02 (Water)

Date Sampled
04/03/2019 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904148

Acetochlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Alachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Atrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Cyanazine	ND	0.20	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Desethylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Dimethenamid	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
EPTC	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Ethalfuralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Fonofos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Metolachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Metribuzin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Pendimethalin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Phorate	ND	0.30	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Prometon	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Propachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Propazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Simazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Terbufos	ND	0.20	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Triallate	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Trifluralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:23	EPA 8270D
Surrogate: Atrazine-d5		104 %	56.9-123		04/05/2019	04/11/2019 06:23	EPA 8270D
Surrogate: Parathion-d10		84.3 %	23.8-169		04/05/2019	04/11/2019 06:23	EPA 8270D
Surrogate: Triphenyl phosphate		98.8 %	50.5-178		04/05/2019	04/11/2019 06:23	EPA 8270D

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904151

2,4-D	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
2,4-DB	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
2,4,5-T	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
Bentazon	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
Dicamba	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
MCPA	ND	0.30	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
Picloram	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
Triclopyr	ND	0.50	ug/L	1	04/08/2019	04/10/2019 04:49	EPA 8151A
Surrogate: 2,4-D-d5		85.6 %	44.2-121		04/08/2019	04/10/2019 04:49	EPA 8151A

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

834661

A191415-03 (Water)

Date Sampled
04/03/2019 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904148

Acetochlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 06:54	EPA 8270D	
Surrogate: Atrazine-d5		109 %		56.9-123	04/05/2019	04/11/2019 06:54	EPA 8270D	
Surrogate: Parathion-d10		81.6 %		23.8-169	04/05/2019	04/11/2019 06:54	EPA 8270D	
Surrogate: Triphenyl phosphate		105 %		50.5-178	04/05/2019	04/11/2019 06:54	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904151

2,4-D	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:24	EPA 8151A	
Surrogate: 2,4-D-d5		95.8 %		44.2-121	04/08/2019	04/10/2019 05:24	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

FB-2
A191415-04 (Water)

Date Sampled
04/03/2019 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904148

Acetochlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:25	EPA 8270D	
Surrogate: Atrazine-d5		87.9 %		56.9-123	04/05/2019	04/11/2019 07:25	EPA 8270D	
Surrogate: Parathion-d10		78.2 %		23.8-169	04/05/2019	04/11/2019 07:25	EPA 8270D	
Surrogate: Triphenyl phosphate		101 %		50.5-178	04/05/2019	04/11/2019 07:25	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904151

2,4-D	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/08/2019	04/10/2019 05:59	EPA 8151A	
Surrogate: 2,4-D-d5		82.4 %		44.2-121	04/08/2019	04/10/2019 05:59	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

834660

Date Sampled

A191415-05 (Water)

04/03/2019 13:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904148

Acetochlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/05/2019	04/11/2019 07:56	EPA 8270D	
Surrogate: Atrazine-d5		102 %		56.9-123	04/05/2019	04/11/2019 07:56	EPA 8270D	
Surrogate: Parathion-d10		77.4 %		23.8-169	04/05/2019	04/11/2019 07:56	EPA 8270D	
Surrogate: Triphenyl phosphate		94.2 %		50.5-178	04/05/2019	04/11/2019 07:56	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904158

2,4-D	ND	0.50	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/10/2019	04/12/2019 17:48	EPA 8151A	
Surrogate: 2,4-D-d5		85.6 %		44.2-121	04/10/2019	04/12/2019 17:48	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904148 - EPA 3510C

Blank (A904148-BLK1)

Prepared: 04/05/2019 Analyzed: 04/10/2019 22:04

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>0.549</i>		<i>ug/L</i>	<i>0.5000</i>		<i>110</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.330</i>		<i>ug/L</i>	<i>0.5000</i>		<i>66.0</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.491</i>		<i>ug/L</i>	<i>0.5000</i>		<i>98.3</i>	<i>50.5-178</i>			

LCS (A904148-BS1)

Prepared: 04/05/2019 Analyzed: 04/10/2019 22:35

Acetochlor	0.888	0.50	ug/L	1.000		88.8	67.8-122			
Alachlor	0.808	0.50	ug/L	1.000		80.8	68.6-119			
Atrazine	0.817	0.50	ug/L	1.000		81.7	68.6-115			
Chlorpyrifos	0.733	0.50	ug/L	1.000		73.3	63.1-120			
Cyanazine	0.791	0.20	ug/L	1.000		79.1	55.3-143			
Desethylatrazine	0.812	0.50	ug/L	1.000		81.2	67.8-115			
Deisopropylatrazine	0.613	0.50	ug/L	1.000		61.3	50.1-100			
Dimethenamid	0.844	0.50	ug/L	1.000		84.4	70.3-121			
EPTC	0.593	0.50	ug/L	1.000		59.3	50.4-101			
Ethalfuralin	0.441	0.50	ug/L	1.000		44.1	42.6-121			
Fonofos	0.676	0.50	ug/L	1.000		67.6	56.6-119			
Metolachlor	0.837	0.50	ug/L	1.000		83.7	71.3-128			
Metribuzin	0.771	0.50	ug/L	1.000		77.1	64.9-120			
Pendimethalin	0.736	0.50	ug/L	1.000		73.6	60.9-128			
Phorate	0.582	0.30	ug/L	1.000		58.2	37.3-112			
Prometon	0.940	0.50	ug/L	1.000		94.0	67.1-120			
Propachlor	0.788	0.50	ug/L	1.000		78.8	66.2-127			
Propazine	0.825	0.50	ug/L	1.000		82.5	68.2-118			
Simazine	0.822	0.50	ug/L	1.000		82.2	67.2-117			

Pace Analytical
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Project: MPCA Freeway LF Water - MN
Project Number: 10469389
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Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904148 - EPA 3510C

LCS (A904148-BS1)

Prepared: 04/05/2019 Analyzed: 04/10/2019 22:35

Terbufos	0.584	0.20	ug/L	1.000		58.4	34.3-111			
Triallate	0.596	0.50	ug/L	1.000		59.6	53-121			
Trifluralin	0.474	0.50	ug/L	1.000		47.4	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.465</i>		<i>ug/L</i>	<i>0.5000</i>		<i>93.0</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.397</i>		<i>ug/L</i>	<i>0.5000</i>		<i>79.4</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.419</i>		<i>ug/L</i>	<i>0.5000</i>		<i>83.8</i>	<i>50.5-178</i>			

LCS Dup (A904148-BS1)

Prepared: 04/05/2019 Analyzed: 04/11/2019 00:09

Acetochlor	0.901	0.50	ug/L	1.000		90.1	67.8-122	1.50	20	
Alachlor	0.823	0.50	ug/L	1.000		82.3	68.6-119	1.83	20	
Atrazine	0.783	0.50	ug/L	1.000		78.3	68.6-115	4.26	20	
Chlorpyrifos	0.710	0.50	ug/L	1.000		71.0	63.1-120	3.24	20	
Cyanazine	0.833	0.20	ug/L	1.000		83.3	55.3-143	5.20	20	
Desethylatrazine	0.806	0.50	ug/L	1.000		80.6	67.8-115	0.637	20	
Deisopropylatrazine	0.646	0.50	ug/L	1.000		64.6	50.1-100	5.24	20	
Dimethenamid	0.834	0.50	ug/L	1.000		83.4	70.3-121	1.28	20	
EPTC	0.641	0.50	ug/L	1.000		64.1	50.4-101	7.77	20	
Ethalfuralin	0.593	0.50	ug/L	1.000		59.3	42.6-121	29.3	20	X
Fonofos	0.705	0.50	ug/L	1.000		70.5	56.6-119	4.11	20	
Metolachlor	0.882	0.50	ug/L	1.000		88.2	71.3-128	5.33	20	
Metribuzin	0.823	0.50	ug/L	1.000		82.3	64.9-120	6.50	20	
Pendimethalin	0.785	0.50	ug/L	1.000		78.5	60.9-128	6.41	20	
Phorate	0.656	0.30	ug/L	1.000		65.6	37.3-112	11.9	20	
Prometon	0.887	0.50	ug/L	1.000		88.7	67.1-120	5.72	20	
Propachlor	0.797	0.50	ug/L	1.000		79.7	66.2-127	1.15	20	
Propazine	0.824	0.50	ug/L	1.000		82.4	68.2-118	0.0364	20	
Simazine	0.791	0.50	ug/L	1.000		79.1	67.2-117	3.81	20	
Terbufos	0.631	0.20	ug/L	1.000		63.1	34.3-111	7.66	20	
Triallate	0.706	0.50	ug/L	1.000		70.6	53-121	17.0	20	
Trifluralin	0.548	0.50	ug/L	1.000		54.8	45.9-116	14.5	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.444</i>		<i>ug/L</i>	<i>0.5000</i>		<i>88.8</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.355</i>		<i>ug/L</i>	<i>0.5000</i>		<i>70.9</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.428</i>		<i>ug/L</i>	<i>0.5000</i>		<i>85.6</i>	<i>50.5-178</i>			

Pace Analytical
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Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904151 - EPA 3510C

Blank (A904151-BLK1)

Prepared: 04/08/2019 Analyzed: 04/10/2019 00:08

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
<i>Surrogate: 2,4-D-d5</i>	1.75		ug/L	2.006		87.4	44.2-121			

LCS (A904151-BS1)

Prepared: 04/08/2019 Analyzed: 04/10/2019 01:19

2,4-D	1.92	0.50	ug/L	2.000		96.0	64.6-148			
2,4-DB	1.99	0.50	ug/L	2.000		99.6	66.7-143			
2,4,5-T	1.72	0.50	ug/L	2.000		86.0	63.4-133			
2,4,5-TP (Silvex)	1.94	0.50	ug/L	2.000		96.9	63-145			
Bentazon	0.994	0.50	ug/L	1.000		99.4	52.5-139			
Dicamba	1.78	0.50	ug/L	2.000		89.1	55.4-143			
MCPA	1.95	0.30	ug/L	2.000		97.4	33.5-143			
Picloram	0.794	0.50	ug/L	1.000		79.4	47.9-113			
Triclopyr	1.89	0.50	ug/L	2.000		94.7	65.1-141			
<i>Surrogate: 2,4-D-d5</i>	1.78		ug/L	2.006		88.5	44.2-121			

LCS Dup (A904151-BS1)

Prepared: 04/08/2019 Analyzed: 04/10/2019 01:54

2,4-D	1.96	0.50	ug/L	2.000		98.2	64.6-148	2.17	20	
2,4-DB	2.00	0.50	ug/L	2.000		100	66.7-143	0.436	20	
2,4,5-T	1.83	0.50	ug/L	2.000		91.5	63.4-133	6.23	20	
2,4,5-TP (Silvex)	1.96	0.50	ug/L	2.000		97.9	63-145	1.00	20	
Bentazon	1.01	0.50	ug/L	1.000		101	52.5-139	1.64	20	
Dicamba	1.82	0.50	ug/L	2.000		90.8	55.4-143	1.83	20	
MCPA	1.90	0.30	ug/L	2.000		95.2	33.5-143	2.33	20	
Picloram	0.715	0.50	ug/L	1.000		71.5	47.9-113	10.4	20	
Triclopyr	1.94	0.50	ug/L	2.000		96.9	65.1-141	2.40	20	
<i>Surrogate: 2,4-D-d5</i>	1.73		ug/L	2.006		86.0	44.2-121			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904158 - EPA 3510C

Blank (A904158-BLK1)

Prepared: 04/10/2019 Analyzed: 04/12/2019 15:27

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
<i>Surrogate: 2,4-D-d5</i>	<i>1.53</i>		<i>ug/L</i>	<i>2.006</i>		<i>76.3</i>	<i>44.2-121</i>			

LCS (A904158-BS1)

Prepared: 04/10/2019 Analyzed: 04/12/2019 16:02

2,4-D	1.80	0.50	ug/L	2.000		90.1	64.6-148			
2,4-DB	1.94	0.50	ug/L	2.000		97.2	66.7-143			
2,4,5-T	1.77	0.50	ug/L	2.000		88.6	63.4-133			
2,4,5-TP (Silvex)	1.85	0.50	ug/L	2.000		92.4	63-145			
Bentazon	0.939	0.50	ug/L	1.000		93.9	52.5-139			
Dicamba	1.71	0.50	ug/L	2.000		85.6	55.4-143			
MCPA	1.83	0.30	ug/L	2.000		91.7	33.5-143			
Picloram	0.807	0.50	ug/L	1.000		80.7	47.9-113			
Triclopyr	1.79	0.50	ug/L	2.000		89.6	65.1-141			
<i>Surrogate: 2,4-D-d5</i>	<i>1.63</i>		<i>ug/L</i>	<i>2.006</i>		<i>81.3</i>	<i>44.2-121</i>			

Matrix Spike (A904158-MS1)

Source: A191420-01

Prepared: 04/10/2019 Analyzed: 04/12/2019 16:38

2,4-D	1.90	0.50	ug/L	1.905	ND	99.6	44.6-158			
2,4-DB	1.78	0.50	ug/L	1.905	ND	93.3	64.7-136			
2,4,5-T	1.62	0.50	ug/L	1.905	ND	85.2	54.1-129			
2,4,5-TP (Silvex)	1.73	0.50	ug/L	1.905	ND	90.8	55.3-147			
Bentazon	0.939	0.50	ug/L	0.9524	ND	98.6	35.5-160			
Dicamba	1.62	0.50	ug/L	1.905	ND	85.2	45.2-150			
MCPA	1.80	0.30	ug/L	1.905	ND	94.3	33.6-149			
Picloram	0.745	0.50	ug/L	0.9524	ND	78.2	32.6-139			
Triclopyr	1.73	0.50	ug/L	1.905	ND	90.7	56.8-143			
<i>Surrogate: 2,4-D-d5</i>	<i>1.56</i>		<i>ug/L</i>	<i>1.911</i>		<i>81.8</i>	<i>44.2-121</i>			

Matrix Spike Dup (A904158-MSD1)

Source: A191420-01

Prepared: 04/10/2019 Analyzed: 04/12/2019 17:13

2,4-D	1.93	0.50	ug/L	1.942	ND	99.6	44.6-158	1.97	20	
2,4-DB	1.91	0.50	ug/L	1.942	ND	98.5	64.7-136	7.31	20	
2,4,5-T	1.76	0.50	ug/L	1.942	ND	90.5	54.1-129	7.97	20	
2,4,5-TP (Silvex)	1.92	0.50	ug/L	1.942	ND	98.9	55.3-147	10.5	20	
Bentazon	1.05	0.50	ug/L	0.9709	ND	109	35.5-160	11.5	20	
Dicamba	1.72	0.50	ug/L	1.942	ND	88.5	45.2-150	5.73	20	
MCPA	1.85	0.30	ug/L	1.942	ND	95.4	33.6-149	3.09	20	
Picloram	0.829	0.50	ug/L	0.9709	ND	85.4	32.6-139	10.7	20	
Triclopyr	1.80	0.50	ug/L	1.942	ND	92.5	56.8-143	3.90	20	
<i>Surrogate: 2,4-D-d5</i>	<i>1.65</i>		<i>ug/L</i>	<i>1.948</i>		<i>84.8</i>	<i>44.2-121</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10469389
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A191415



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Owner Received Date: 4/3/2019 Results Requested By: 4/24/2019

Workorder: 10469389

Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Report To		Subcontract To				Requested Analysis															
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Unpreserved AGIU	Preserved Containers				MDA List 1	MDA List 2									LAB USE ONLY
1	834662	PS	4/3/2019 09:20	10469389001	Water	4					X	X									01
2	834663	PS	4/3/2019 10:40	10469389002	Water	4					X	X									02
3	834661	PS	4/3/2019 11:35	10469389003	Water	4					X	X									03
4	FB-2	PS	4/3/2019 12:30	10469389004	Water	4					X	X									04
5	834660	PS	4/3/2019 13:30	10469389005	Water	4					X	X									05

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	4/19/19 1425	<i>[Signature]</i>	4/5/19 830	Need MPCA Equis EDD and Barr Equis 5 EDD
2					
3					

Cooler Temperature on Receipt 1.5 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp 7/13/19

April 29, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10470295

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas DW Certification #: MN00064
 Arkansas WW Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064
 Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
 Minnesota Petrofund Certification #: 1240
 Mississippi Certification #: MN00064
 Missouri Certification #: 10100
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon Primary Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Vermont Certification #: VT-027053137
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DEP Certification #: 382
 West Virginia DW Certification #: 9952 C
 Wisconsin Certification #: 999407970
 Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Alaska Certification UST-107
 Montana Certificate #CERT0103
 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad
 Florida/TNI Certification #: E87683

Georgia Certification #: C040
 Guam Certification
 Florida: Cert E871149 SEKS WET
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133
 KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10470295001	837777	Water	04/10/19 11:10	04/10/19 14:00
10470295002	837776	Water	04/10/19 13:10	04/10/19 14:00

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10470295001	837777	EPA 8082A	RAG	11	PASI-M		
		EPA 200.7	DM	9	PASI-M		
		EPA 200.8	BWB	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	CLA	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10470295002	837776	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
				EPA 200.8	BWB	12	PASI-M
EPA 8270D	STB			38	PASI-M		
	CLJ			16	PASI-V		
EPA 900.0	CLA			2	PASI-PA		
EPA 300.0	KEO			1	PASI-M		
SM 3500-Cr B Modified	JFP			1	PASI-M		
EPA 350.1	CLJ			1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V		
SM 4500-CN-E	DCL			1	PASI-M		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Sample: 837777		Lab ID: 10470295001		Collected: 04/10/19 11:10	Received: 04/10/19 14:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.097	1	04/10/19 17:39	04/12/19 10:33	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	73	%	30-125	1	04/10/19 17:39	04/12/19 10:33	877-09-8	
Decachlorobiphenyl (S)	49	%	30-125	1	04/10/19 17:39	04/12/19 10:33	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/12/19 06:45	04/15/19 10:08	7429-90-5	
Barium, Dissolved	1250	ug/L	10.0	1	04/12/19 06:45	04/15/19 10:08	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/12/19 06:45	04/15/19 10:08	7440-50-8	
Manganese, Dissolved	208	ug/L	5.0	1	04/12/19 06:45	04/15/19 10:08	7439-96-5	
Nickel, Dissolved	35.7	ug/L	20.0	1	04/12/19 06:45	04/15/19 10:08	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/12/19 06:45	04/15/19 10:08	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	04/12/19 06:45	04/15/19 10:08	7440-31-5	
Total Hardness by 2340B, Dissolved	445000	ug/L	3300	1	04/12/19 06:45	04/15/19 10:08		
Zinc, Dissolved	ND	ug/L	20.0	1	04/12/19 06:45	04/15/19 10:08	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:21	7440-36-0	
Arsenic, Dissolved	7.5	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:21	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/12/19 14:52	04/15/19 18:21	7440-41-7	
Boron, Dissolved	1260	ug/L	200	20	04/12/19 14:52	04/15/19 18:24	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/12/19 14:52	04/15/19 18:21	7440-43-9	
Chromium, Dissolved	0.66	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:21	7440-47-3	
Cobalt, Dissolved	6.9	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:21	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/12/19 14:52	04/15/19 18:21	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:21	7782-49-2	
Thallium, Dissolved	0.18	ug/L	0.10	1	04/12/19 14:52	04/15/19 18:21	7440-28-0	
Uranium-238, Dissolved	ND	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:21	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/12/19 14:52	04/15/19 18:21	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	83-32-9	
Anthracene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	50-32-8	
Benzoic acid	ND	ug/L	48.5	1	04/12/19 14:57	04/18/19 14:22	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Sample: 837777 **Lab ID: 10470295001** Collected: 04/10/19 11:10 Received: 04/10/19 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.5	1	04/12/19 14:57	04/18/19 14:22	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	120-83-2	
Diethylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	105-67-9	
Dimethylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	117-81-7	
Fluoranthene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	206-44-0	
Fluorene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	86-73-7	
Hexachlorobenzene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.5	1	04/12/19 14:57	04/18/19 14:22	77-47-4	L2
Hexachloroethane	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	67-72-1	
Isophorone	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.4	1	04/12/19 14:57	04/18/19 14:22		
N-Nitrosodimethylamine	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	62-75-9	
Pentachlorophenol	ND	ug/L	19.4	1	04/12/19 14:57	04/18/19 14:22	87-86-5	
Phenanthrene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	85-01-8	
Phenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	108-95-2	
Pyrene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:22	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	84	%.	55-125	1	04/12/19 14:57	04/18/19 14:22	4165-60-0	
2-Fluorobiphenyl (S)	81	%.	52-125	1	04/12/19 14:57	04/18/19 14:22	321-60-8	
p-Terphenyl-d14 (S)	103	%.	57-125	1	04/12/19 14:57	04/18/19 14:22	1718-51-0	
Phenol-d6 (S)	87	%.	30-125	1	04/12/19 14:57	04/18/19 14:22	13127-88-3	
2-Fluorophenol (S)	85	%.	30-125	1	04/12/19 14:57	04/18/19 14:22	367-12-4	
2,4,6-Tribromophenol (S)	107	%.	52-125	1	04/12/19 14:57	04/18/19 14:22	118-79-6	

Field Data

Analytical Method:

Collected Date	04/10/19			1		04/10/19 11:10		
Collected Time	1110			1		04/10/19 11:10		
Field pH	7.2	Std. Units		1		04/10/19 11:10		
Field Temperature	10.5	deg C		1		04/10/19 11:10		
Field Specific Conductance	1930	umhos/cm		1		04/10/19 11:10		
Oxygen, Dissolved	0.5	mg/L		1		04/10/19 11:10	7782-44-7	
REDOX	-138	mV		1		04/10/19 11:10		
Turbidity	3.1	NTU		1		04/10/19 11:10		
Apparent Color	Clear			1		04/10/19 11:10		
Odor	No			1		04/10/19 11:10		
Well Locked	Yes			1		04/10/19 11:10		
Purge Method	Grundfos Redi-Flo			1		04/10/19 11:10		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Sample: 837777		Lab ID: 10470295001		Collected: 04/10/19 11:10	Received: 04/10/19 14:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Total Well Depth	84.50	feet		1		04/10/19 11:10		
Depth of Water	69.79			1		04/10/19 11:10		
Well Volume Purged	30.0			1		04/10/19 11:10		
Purge Rate	0.5			1		04/10/19 11:10		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	240	mg/L	12.0	10		04/11/19 14:07	16887-00-6	M6
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		04/11/19 09:02		FS,M1
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	0.091	mg/L	0.010	1		04/16/19 16:27		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	29.9	mg/L	1.1	10	04/16/19 09:07	04/16/19 14:36	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	04/19/19 09:18	04/19/19 12:20	57-12-5	

Sample: 837776		Lab ID: 10470295002		Collected: 04/10/19 13:10	Received: 04/10/19 14:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	04/10/19 17:39	04/12/19 10:48	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	80	%	30-125	1	04/10/19 17:39	04/12/19 10:48	877-09-8	
Decachlorobiphenyl (S)	59	%	30-125	1	04/10/19 17:39	04/12/19 10:48	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	04/12/19 06:45	04/15/19 10:09	7429-90-5	
Barium, Dissolved	1090	ug/L	10.0	1	04/12/19 06:45	04/15/19 10:09	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	04/12/19 06:45	04/15/19 10:09	7440-50-8	
Manganese, Dissolved	1190	ug/L	5.0	1	04/12/19 06:45	04/15/19 10:09	7439-96-5	
Nickel, Dissolved	42.0	ug/L	20.0	1	04/12/19 06:45	04/15/19 10:09	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	04/12/19 06:45	04/15/19 10:09	7440-22-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Sample: 837776	Lab ID: 10470295002	Collected: 04/10/19 13:10	Received: 04/10/19 14:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	04/12/19 06:45	04/15/19 10:09	7440-31-5	
Total Hardness by 2340B, Dissolved	447000	ug/L	3300	1	04/12/19 06:45	04/15/19 10:09		
Zinc, Dissolved	ND	ug/L	20.0	1	04/12/19 06:45	04/15/19 10:09	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:36	7440-36-0	
Arsenic, Dissolved	4.2	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:36	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	04/12/19 14:52	04/15/19 18:36	7440-41-7	
Boron, Dissolved	567	ug/L	200	20	04/12/19 14:52	04/15/19 18:39	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	04/12/19 14:52	04/15/19 18:36	7440-43-9	
Chromium, Dissolved	0.59	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:36	7440-47-3	
Cobalt, Dissolved	38.9	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:36	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	04/12/19 14:52	04/15/19 18:36	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:36	7782-49-2	
Thallium, Dissolved	1.3	ug/L	0.10	1	04/12/19 14:52	04/15/19 18:36	7440-28-0	
Uranium-238, Dissolved	0.78	ug/L	0.50	1	04/12/19 14:52	04/15/19 18:36	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	04/12/19 14:52	04/15/19 18:36	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	83-32-9	
Anthracene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	50-32-8	
Benzoic acid	ND	ug/L	48.3	1	04/12/19 14:57	04/18/19 14:51	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	111-44-4	
2-Chlorophenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.3	1	04/12/19 14:57	04/18/19 14:51	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	120-83-2	
Diethylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	105-67-9	
Dimethylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	117-81-7	
Fluoranthene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	206-44-0	
Fluorene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	86-73-7	
Hexachlorobenzene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.3	1	04/12/19 14:57	04/18/19 14:51	77-47-4	L2
Hexachloroethane	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	67-72-1	
Isophorone	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	19.3	1	04/12/19 14:57	04/18/19 14:51		
N-Nitrosodimethylamine	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Sample: 837776	Lab ID: 10470295002	Collected: 04/10/19 13:10	Received: 04/10/19 14:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Pentachlorophenol	ND	ug/L	19.3	1	04/12/19 14:57	04/18/19 14:51	87-86-5	
Phenanthrene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	85-01-8	
Phenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	108-95-2	
Pyrene	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.7	1	04/12/19 14:57	04/18/19 14:51	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	81	%	55-125	1	04/12/19 14:57	04/18/19 14:51	4165-60-0	
2-Fluorobiphenyl (S)	75	%	52-125	1	04/12/19 14:57	04/18/19 14:51	321-60-8	
p-Terphenyl-d14 (S)	99	%	57-125	1	04/12/19 14:57	04/18/19 14:51	1718-51-0	
Phenol-d6 (S)	84	%	30-125	1	04/12/19 14:57	04/18/19 14:51	13127-88-3	
2-Fluorophenol (S)	83	%	30-125	1	04/12/19 14:57	04/18/19 14:51	367-12-4	
2,4,6-Tribromophenol (S)	102	%	52-125	1	04/12/19 14:57	04/18/19 14:51	118-79-6	
Field Data								
Analytical Method:								
Collected Date	04/10/19			1		04/10/19 13:10		
Collected Time	1310			1		04/10/19 13:10		
Field pH	7.1	Std. Units		1		04/10/19 13:10		
Field Temperature	11.5	deg C		1		04/10/19 13:10		
Field Specific Conductance	1340	umhos/cm		1		04/10/19 13:10		
Oxygen, Dissolved	0.3	mg/L		1		04/10/19 13:10	7782-44-7	
REDOX	-97	mV		1		04/10/19 13:10		
Turbidity	14.2	NTU		1		04/10/19 13:10		
Apparent Color	Clear			1		04/10/19 13:10		
Odor	No			1		04/10/19 13:10		
Well Locked	Yes			1		04/10/19 13:10		
Purge Method	Grundfos Redi-Flo			1		04/10/19 13:10		
Total Well Depth	89.05	feet		1		04/10/19 13:10		
Depth of Water	74.19			1		04/10/19 13:10		
Well Volume Purged	30.0			1		04/10/19 13:10		
Purge Rate	0.5			1		04/10/19 13:10		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	139	mg/L	2.4	2		04/11/19 15:11	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		04/11/19 09:02		FS
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.031	mg/L	0.010	1		04/16/19 16:29		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	11.9	mg/L	0.55	5	04/16/19 09:07	04/16/19 14:33	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	04/19/19 09:18	04/19/19 12:20	57-12-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10470295

QC Batch: 599041 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10470295001, 10470295002

METHOD BLANK: 3238544 Matrix: Water
Associated Lab Samples: 10470295001, 10470295002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	04/15/19 09:43	
Barium, Dissolved	ug/L	ND	10.0	04/15/19 09:43	
Copper, Dissolved	ug/L	ND	10.0	04/15/19 09:43	
Manganese, Dissolved	ug/L	ND	5.0	04/15/19 09:43	
Nickel, Dissolved	ug/L	ND	20.0	04/15/19 09:43	
Silver, Dissolved	ug/L	ND	10.0	04/15/19 09:43	
Tin, Dissolved	ug/L	ND	75.0	04/15/19 09:43	
Zinc, Dissolved	ug/L	ND	20.0	04/15/19 09:43	

LABORATORY CONTROL SAMPLE: 3238545

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	22000	110	85-115	
Barium, Dissolved	ug/L	1000	1030	103	85-115	
Copper, Dissolved	ug/L	1000	1020	102	85-115	
Manganese, Dissolved	ug/L	1000	1050	105	85-115	
Nickel, Dissolved	ug/L	1000	1030	103	85-115	
Silver, Dissolved	ug/L	500	524	105	85-115	
Tin, Dissolved	ug/L	1000	1020	102	85-115	
Zinc, Dissolved	ug/L	1000	1050	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3238546 3238547

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10469872001 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum, Dissolved	ug/L	ND	20000	20000	23000	22800	115	114	70-130	1	20		
Barium, Dissolved	ug/L	35.8	1000	1000	1070	1070	104	103	70-130	0	20		
Copper, Dissolved	ug/L	ND	1000	1000	1060	1050	106	105	70-130	1	20		
Manganese, Dissolved	ug/L	25.3	1000	1000	1080	1080	105	105	70-130	0	20		
Nickel, Dissolved	ug/L	ND	1000	1000	1010	998	101	100	70-130	1	20		
Silver, Dissolved	ug/L	ND	500	500	552	550	110	110	70-130	0	20		
Tin, Dissolved	ug/L	ND	1000	1000	1020	990	102	99	70-130	3	20		
Zinc, Dissolved	ug/L	ND	1000	1000	1020	1010	101	101	70-130	1	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10470295

QC Batch: 599044 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10470295001, 10470295002

METHOD BLANK: 3238557 Matrix: Water
Associated Lab Samples: 10470295001, 10470295002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	04/15/19 16:53	
Arsenic, Dissolved	ug/L	ND	0.50	04/15/19 16:53	
Beryllium, Dissolved	ug/L	ND	0.20	04/15/19 16:53	
Boron, Dissolved	ug/L	ND	10.0	04/15/19 16:53	
Cadmium, Dissolved	ug/L	ND	0.080	04/15/19 16:53	
Chromium, Dissolved	ug/L	ND	0.50	04/15/19 16:53	
Cobalt, Dissolved	ug/L	ND	0.50	04/15/19 16:53	
Lead, Dissolved	ug/L	ND	0.10	04/15/19 16:53	
Selenium, Dissolved	ug/L	ND	0.50	04/15/19 16:53	
Thallium, Dissolved	ug/L	ND	0.10	04/15/19 16:53	
Uranium-238, Dissolved	ug/L	ND	0.50	04/15/19 16:53	
Vanadium, Dissolved	ug/L	ND	1.0	04/15/19 16:53	

LABORATORY CONTROL SAMPLE: 3238558

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	93.7	94	85-115	
Arsenic, Dissolved	ug/L	100	89.9	90	85-115	
Beryllium, Dissolved	ug/L	100	99.8	100	85-115	
Boron, Dissolved	ug/L	100	99.0	99	85-115	
Cadmium, Dissolved	ug/L	100	92.4	92	85-115	
Chromium, Dissolved	ug/L	100	97.9	98	85-115	
Cobalt, Dissolved	ug/L	100	100	100	85-115	
Lead, Dissolved	ug/L	100	97.8	98	85-115	
Selenium, Dissolved	ug/L	100	99.8	100	85-115	
Thallium, Dissolved	ug/L	100	96.7	97	85-115	
Uranium-238, Dissolved	ug/L	100	97.4	97	85-115	
Vanadium, Dissolved	ug/L	100	96.0	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3238559 3238560

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10469872002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony, Dissolved	ug/L	ND	100	100	91.2	94.3	91	94	70-130	3	20	
Arsenic, Dissolved	ug/L	0.61	100	100	92.4	96.1	92	95	70-130	4	20	
Beryllium, Dissolved	ug/L	ND	100	100	107	114	107	113	70-130	6	20	
Boron, Dissolved	ug/L	155	100	100	278	294	122	138	70-130	6	20	M1
Cadmium, Dissolved	ug/L	ND	100	100	91.1	93.1	91	93	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Parameter	Units	3238559		3238560		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10469872002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Chromium, Dissolved	ug/L	ND	100	100	93.8	97.3	94	97	70-130	4	20	
Cobalt, Dissolved	ug/L	ND	100	100	94.7	98.3	94	98	70-130	4	20	
Lead, Dissolved	ug/L	ND	100	100	89.2	90.9	89	91	70-130	2	20	
Selenium, Dissolved	ug/L	3.1	100	100	111	118	108	115	70-130	6	20	
Thallium, Dissolved	ug/L	ND	100	100	89.3	90.7	89	91	70-130	2	20	
Uranium-238, Dissolved	ug/L	7.2	100	100	105	108	97	101	70-130	3	20	
Vanadium, Dissolved	ug/L	ND	100	100	94.9	98.6	95	98	70-130	4	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10470295

QC Batch: 598633 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10470295001, 10470295002

METHOD BLANK: 3236649 Matrix: Water
Associated Lab Samples: 10470295001, 10470295002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	04/12/19 08:16	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	04/12/19 08:16	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	04/12/19 08:16	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	04/12/19 08:16	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	04/12/19 08:16	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	04/12/19 08:16	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	04/12/19 08:16	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	04/12/19 08:16	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	04/12/19 08:16	
Decachlorobiphenyl (S)	%	71	30-125	04/12/19 08:16	
Tetrachloro-m-xylene (S)	%	49	30-125	04/12/19 08:16	

LABORATORY CONTROL SAMPLE & LCSD: 3236650

3236651

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.4	81	69	45-125	16	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.8	1.6	90	80	49-125	11	20	
Decachlorobiphenyl (S)	%				104	90	30-125			
Tetrachloro-m-xylene (S)	%				73	53	30-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10470295

QC Batch: 599196 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10470295001, 10470295002

METHOD BLANK: 3239525 Matrix: Water
Associated Lab Samples: 10470295001, 10470295002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	04/16/19 12:09	
2,4-Dichlorophenol	ug/L	ND	10.0	04/16/19 12:09	
2,4-Dimethylphenol	ug/L	ND	10.0	04/16/19 12:09	
2,4-Dinitrophenol	ug/L	ND	10.0	04/16/19 12:09	
2-Chlorophenol	ug/L	ND	10.0	04/16/19 12:09	
2-Methylnaphthalene	ug/L	ND	10.0	04/16/19 12:09	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	04/16/19 12:09	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	20.0	04/16/19 12:09	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	04/16/19 12:09	
4-Bromophenylphenyl ether	ug/L	ND	10.0	04/16/19 12:09	
Acenaphthene	ug/L	ND	10.0	04/16/19 12:09	
Anthracene	ug/L	ND	10.0	04/16/19 12:09	
Benzo(a)pyrene	ug/L	ND	10.0	04/16/19 12:09	
Benzoic acid	ug/L	ND	50.0	04/16/19 12:09	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	04/16/19 12:09	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	04/16/19 12:09	
Butylbenzylphthalate	ug/L	ND	10.0	04/16/19 12:09	
Di-n-butylphthalate	ug/L	ND	10.0	04/16/19 12:09	
Di-n-octylphthalate	ug/L	ND	10.0	04/16/19 12:09	
Diethylphthalate	ug/L	ND	10.0	04/16/19 12:09	
Dimethylphthalate	ug/L	ND	10.0	04/16/19 12:09	
Fluoranthene	ug/L	ND	10.0	04/16/19 12:09	
Fluorene	ug/L	ND	10.0	04/16/19 12:09	
Hexachlorobenzene	ug/L	ND	10.0	04/16/19 12:09	
Hexachlorocyclopentadiene	ug/L	ND	50.0	04/16/19 12:09	
Hexachloroethane	ug/L	ND	10.0	04/16/19 12:09	
Isophorone	ug/L	ND	10.0	04/16/19 12:09	
N-Nitrosodimethylamine	ug/L	ND	10.0	04/16/19 12:09	
Pentachlorophenol	ug/L	ND	20.0	04/16/19 12:09	
Phenanthrene	ug/L	ND	10.0	04/16/19 12:09	
Phenol	ug/L	ND	10.0	04/16/19 12:09	
Pyrene	ug/L	ND	10.0	04/16/19 12:09	
2,4,6-Tribromophenol (S)	%	97	52-125	04/16/19 12:09	
2-Fluorobiphenyl (S)	%	74	52-125	04/16/19 12:09	
2-Fluorophenol (S)	%	79	30-125	04/16/19 12:09	
Nitrobenzene-d5 (S)	%	79	55-125	04/16/19 12:09	
p-Terphenyl-d14 (S)	%	101	57-125	04/16/19 12:09	
Phenol-d6 (S)	%	77	30-125	04/16/19 12:09	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

LABORATORY CONTROL SAMPLE & LCSD: 3239526		3239527									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	46.5	45.1	93	90	60-125	3	20		
2,4-Dichlorophenol	ug/L	50	41.5	41.7	83	83	56-125	0	20		
2,4-Dimethylphenol	ug/L	50	29.1	24.4	58	49	33-125	18	20		
2,4-Dinitrophenol	ug/L	50	45.1	46.9	90	94	32-125	4	20		
2-Chlorophenol	ug/L	50	35.9	37.3	72	75	52-125	4	20		
2-Methylnaphthalene	ug/L	50	41.3	41.2	83	82	52-125	0	20		
2-Methylphenol(o-Cresol)	ug/L	50	36.8	37.1	74	74	55-125	1	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	39.2	39.5	78	79	57-125	1	20		
3,3'-Dichlorobenzidine	ug/L	50	47.6J	41.5J	95	83	39-150		20		
4-Bromophenylphenyl ether	ug/L	50	45.5	45.5	91	91	61-125	0	20		
Acenaphthene	ug/L	50	43.4	42.9	87	86	59-125	1	20		
Anthracene	ug/L	50	45.8	45.3	92	91	64-125	1	20		
Benzo(a)pyrene	ug/L	50	44.4	43.6	89	87	63-125	2	20		
Benzoic acid	ug/L	50	44.6J	39.6J	89	79	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	36.2	37.9	72	76	49-125	4	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	47.8	47.8	96	96	68-125	0	20		
Butylbenzylphthalate	ug/L	50	47.8	47.3	96	95	67-125	1	20		
Di-n-butylphthalate	ug/L	50	46.6	47.1	93	94	67-125	1	20		
Di-n-octylphthalate	ug/L	50	48.4	47.8	97	96	67-125	1	20		
Diethylphthalate	ug/L	50	45.3	44.5	91	89	64-125	2	20		
Dimethylphthalate	ug/L	50	45.1	44.3	90	89	65-125	2	20		
Fluoranthene	ug/L	50	45.8	45.4	92	91	64-125	1	20		
Fluorene	ug/L	50	44.4	43.4	89	87	63-125	2	20		
Hexachlorobenzene	ug/L	50	44.5	43.9	89	88	61-125	1	20		
Hexachlorocyclopentadiene	ug/L	50	ND	ND	16	15	30-125		20	L2	
Hexachloroethane	ug/L	50	34.0	35.4	68	71	30-125	4	20		
Isophorone	ug/L	50	44.6	44.1	89	88	59-125	1	20		
N-Nitrosodimethylamine	ug/L	50	40.1	39.6	80	79	43-125	1	20	1M	
Pentachlorophenol	ug/L	50	57.4	56.3	115	113	35-125	2	20		
Phenanthrene	ug/L	50	44.7	45.2	89	90	65-125	1	20		
Phenol	ug/L	50	37.4	38.4	75	77	54-125	3	20		
Pyrene	ug/L	50	46.1	45.6	92	91	65-125	1	20		
2,4,6-Tribromophenol (S)	%				101	97	52-125				
2-Fluorobiphenyl (S)	%				84	81	52-125				
2-Fluorophenol (S)	%				73	74	30-125				
Nitrobenzene-d5 (S)	%				78	77	55-125				
p-Terphenyl-d14 (S)	%				95	95	57-125				
Phenol-d6 (S)	%				75	76	30-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10470295

QC Batch: 598690 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10470295001, 10470295002

METHOD BLANK: 3236831 Matrix: Water
Associated Lab Samples: 10470295001, 10470295002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	04/10/19 20:11	

LABORATORY CONTROL SAMPLE: 3236832

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3236846 3236847

Parameter	Units	10470255006		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	147	62.5	62.5	188	188	66	66	90-110	0	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3237864 3237865

Parameter	Units	10470295001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	240	125	125	344	344	83	83	90-110	0	20	M6	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

QC Batch: 598875	Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10470295001, 10470295002	

METHOD BLANK: 3237874 Matrix: Water

Associated Lab Samples: 10470295001, 10470295002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	04/11/19 09:02	FS

LABORATORY CONTROL SAMPLE: 3237875

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	94	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3237876 3237877

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10470295001 Result	Spike Conc.	Spike Conc.	Conc.								
Chromium, Hexavalent	mg/L	ND	0.2	0.2	0.080	0.074	38	35	85-115	8	20	FS,M1	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

QC Batch: 164346

Analysis Method: EPA 350.1 rev. 2 (1993)

QC Batch Method: EPA 350.1 rev. 2 (1993)

Analysis Description: 350.1 Ammonia Distilled

Associated Lab Samples: 10470295001, 10470295002

METHOD BLANK: 647484

Matrix: Water

Associated Lab Samples: 10470295001, 10470295002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	04/16/19 13:52	

LABORATORY CONTROL SAMPLE: 647485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 647486 647487

Parameter	Units	647486		647487		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		12123517002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Nitrogen, Ammonia	mg/L	ND	5	5	5.1	5.2	101	102	90-110	1	10		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10470295

QC Batch: 600214 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10470295001, 10470295002

METHOD BLANK: 3244808 Matrix: Water
Associated Lab Samples: 10470295001, 10470295002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	04/19/19 11:54	

LABORATORY CONTROL SAMPLE: 3244809

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	250	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3244810 3244811

Parameter	Units	10471130001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Cyanide	ug/L	0.024 mg/L	250	250	237	219	85	78	80-120	8	30	M1		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3244812 3244813

Parameter	Units	10471132001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Cyanide	ug/L	ND	250	250	226	261	85	99	80-120	14	30			

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	5.24 ± 3.14 (5.12) C:NA T:NA	pCi/L	04/18/19 18:08	12587-46-1	
Gross Beta		EPA 900.0	18.7 ± 4.24 (3.66) C:NA T:NA	pCi/L	04/18/19 18:08	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	6.89 ± 2.49 (2.98) C:NA T:NA	pCi/L	04/18/19 18:09	12587-46-1	
Gross Beta		EPA 900.0	8.25 ± 2.10 (2.16) C:NA T:NA	pCi/L	04/18/19 18:09	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

QC Batch: 338742

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10470295001, 10470295002

METHOD BLANK: 1648700

Matrix: Water

Associated Lab Samples: 10470295001, 10470295002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.181 ± 0.507 (1.26) C:NA T:NA	pCi/L	04/19/19 08:12	
Gross Beta	0.188 ± 0.813 (1.93) C:NA T:NA	pCi/L	04/19/19 08:12	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10470295

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10470295
[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 599105
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

ANALYTE QUALIFIERS

- 1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value
- FS The sample was filtered in the laboratory prior to analysis.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10470295

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10470295001	837777	EPA Mod. 3510C	598633	EPA 8082A	599105
10470295002	837776	EPA Mod. 3510C	598633	EPA 8082A	599105
10470295001	837777	EPA 200.7	599041	EPA 200.7	599255
10470295002	837776	EPA 200.7	599041	EPA 200.7	599255
10470295001	837777	EPA 200.8	599044	EPA 200.8	599500
10470295002	837776	EPA 200.8	599044	EPA 200.8	599500
10470295001	837777	EPA 3520	599196	EPA 8270D	599776
10470295002	837776	EPA 3520	599196	EPA 8270D	599776
10470295001	837777				
10470295002	837776				
10470295001	837777	EPA 900.0	338742		
10470295002	837776	EPA 900.0	338742		
10470295001	837777	EPA 300.0	598690		
10470295002	837776	EPA 300.0	598690		
10470295001	837777	SM 3500-Cr B Modified	598875		
10470295002	837776	SM 3500-Cr B Modified	598875		
10470295001	837777	EPA 350.1			
10470295002	837776	EPA 350.1			
10470295001	837777	EPA 350.1 rev. 2 (1993)	164346	EPA 350.1 rev. 2 (1993)	164351
10470295002	837776	EPA 350.1 rev. 2 (1993)	164346	EPA 350.1 rev. 2 (1993)	164351
10470295001	837777	SM 4500-CN-E	600214	SM 4500-CN-E	600574
10470295002	837776	SM 4500-CN-E	600214	SM 4500-CN-E	600574

REPORT OF LABORATORY ANALYSIS

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WO#: 10470295



10470295



Minnesota Pollution Control Agency

Chain-of-Custody Form rev. 2013.0909

Work Order Number:

Turnaround Time:

Page: / of /

PROJECT/CLIENT INFO

Facility Code: MNSW-057 Program Code (MDH Lab Only):
 Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters Project Task Code: PRJ07786
 Project Manager: Brad Jacobson 612-607-6375 EPIC PROFILE #: 38716 Line 2
 Potential Hazard? If yes, add information to Sampler Comments Section

Lab Name: Pace Analytical - Minneapolis, MN
 Address: 1700 SE Elm Street
 Minneapolis MN 55414
 Phone No: 612-607-6400

FOR LAB USE ONLY

Lab Work Order Sticker

SAMPLE DETAILS

SAMPLE TYPE CODES

Sample-Routine Sample
 S-IVP=Integrated Vertical Profile Sample
 S-CWOP=Composite Sample

QC-FB=Field Blank Sample
 QC-FR=Field Replicate Sample
 QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
 NW=Non-potable Water
 SD=Soil/Solid
 WP=Wipe

AR=Air
 BL=Biological Material
 OT=Other
 TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
 Wt-Surf=Surface Water
 QC-BLANK=Artificial Blank Water
 Leachate=Leachate Sample

ANALYSIS REQUESTED

PRESERV. None HNO3 None H2SO4 NaOH None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/Un-ionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SVOC, 8082, MDA1, MDA2 - QAPP Table 3a	Lab Sample No.	#
837777	sample	4/10/19	1110			G	NW	Wt-Ground	N		14	X	X	X	X	X	X	X	W1	1
837776	sample	4/10/19	1310			G	NW	Wt-Ground	N		14	X	X	X	X	X	X	X	W2	2
									N											3
									N											4
									N											5
									N											6
									N											7
									N											8
									N											9
									N											10

DATA 4/10/19

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation

(Sampler) David Anderson / Pace Analytical

Date/Time 4/10/19 / 1400

Accepted By/ Affiliation

[Signature]

Date/Time

4/10/19 1400

I 8.2 (5)

Sample Condition Upon Receipt **Client Name:** MN Pollution Control Agency **Project #:** **WO# : 10470295**

Courier: Fed Ex UPS USPS Client
 Pace Speedee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Biological Tissue Frozen?** Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: PB **Temp Blank?** Yes No

Thermometer: T1(0461) T2(1336) T3(0459)
 T4(0254) T5(0048) **Type of Ice:** Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: _____ °C	Average Corrected Temp See Exceptions
Correction Factor: <u>True</u>	Cooler Temp Corrected w/temp blank: _____ °C	(no temp blank only): <input checked="" type="checkbox"/> <u>8.1°C</u>

USDA Regulated Soil: (N/A, water sample/Other: _____) **Date/Initials of Person Examining Contents:** CG 4/10/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input checked="" type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: See Exception
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>1-2²/₂</u> <u>1-2²/₂</u> <u>1-2¹/₁</u> <input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Positive for Res. Chlorine? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No See Exception
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	pH Paper Lot# Res. Chlorine 0-6 Roll 0-6 Strip 0-14 Strip <u>1402LB R9/16</u> <u>225718</u> <u>1603581</u>
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): <u>N/A</u>
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ **Field Data Required?** Yes No

Comments/Resolution: _____

Project Manager Review: [Signature] Date: 04/11/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: [Signature]

WO#: 12123568



Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes

Owner Received Date: 4/10/2019 Results Requested By: 5/1/2019

Workorder: 10470295

Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Report To		Subcontract To					Requested Analysis																
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																					
							350.1 Ammonia Unionized Ammonia																
							LAB USE ONLY																
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers																	
1	837777	PS	4/10/2019 11:10	10470295001	Water	1																	
2	837776	PS	4/10/2019 13:10	10470295002	Water	1																	
3																							
4																							
5																							

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	4/11/19 1500	<i>[Signature]</i>	4/11/19 1800						
<i>[Signature]</i>	4/11/19 2300	B. Mathews	4/12/19 0800						

Cooler Temperature on Receipt 1.3 °C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form

Document No.:
F-VM-C-001-Rev.12

Document Revised: 03Apr2019
Page 1 of 1

Issuing Authority:
Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Pace MN

Project #: _____

WO#: 12123568

PM: CLJ Due Date: 05/02/19

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 4/11/19 DC
Comments: Bm 4/12/19

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Katie Richards Date: 4/12/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt

30289275



Client Name: Pace MN Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4163801938747

Label	<u>MJS</u>
LIMS Login	<u>MJS</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 11 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 3.8 °C Correction Factor: +0.0 °C Final Temp: 3.8 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>MJS 4-13-19</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1. <u>N/A</u>
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>wt</u>	/			5.
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used: -Pace Containers Used:	/			10.
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16. <u>PHLZ</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>MJS</u> Date/time of preservation: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>MJS</u> Date: <u>4-13-19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



25-Apr-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10470295**

Work Order: **1904840**

Dear Jennifer,

ALS Environmental received 2 samples on 12-Apr-2019 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 9.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10470295
Work Order: 1904840

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1904840-01	837777	Water		4/10/2019 11:10	4/12/2019 09:30	<input type="checkbox"/>
1904840-02	837776	Water		4/10/2019 13:10	4/12/2019 09:30	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10470295
Work Order: 1904840

Case Narrative

Batch R259157, Method CNF_9014_W, Sample 1904840-01A MS/MSD: The MS/MSD recovery was below the lower control limit for Free Cyanide. The corresponding result in the parent sample may be biased low.

Client: Pace Analytical Services, LLC
Project: 10470295
WorkOrder: 1904840

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 25-Apr-19

Client: Pace Analytical Services, LLC

Project: 10470295

Work Order: 1904840

Sample ID: 837777

Lab ID: 1904840-01

Collection Date: 4/10/2019 11:10 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/24/2019 04:50 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 25-Apr-19

Client: Pace Analytical Services, LLC**Project:** 10470295**Work Order:** 1904840**Sample ID:** 837776**Lab ID:** 1904840-02**Collection Date:** 4/10/2019 01:10 PM**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	4/24/2019 04:50 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 1904840
Project: 10470295

QC BATCH REPORT

Batch ID: **R259157** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R259157-R259157				Units: µg/L		Analysis Date: 4/24/2019 04:50 PM		
Client ID:		Run ID: WETCHEM_1904240		SeqNo: 5624244		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	ND	20								

LCS		Sample ID: LCS-R259157-R259157				Units: µg/L		Analysis Date: 4/24/2019 04:50 PM		
Client ID:		Run ID: WETCHEM_1904240		SeqNo: 5624245		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	257.3	20	250	0	103	81-119	0			

MS		Sample ID: 1904840-01A MS				Units: µg/L		Analysis Date: 4/24/2019 04:50 PM		
Client ID: 837777		Run ID: WETCHEM_1904240		SeqNo: 5624248		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	172.1	20	250	6.67	66.2	81-119	0			S

MSD		Sample ID: 1904840-01A MSD				Units: µg/L		Analysis Date: 4/24/2019 04:50 PM		
Client ID: 837777		Run ID: WETCHEM_1904240		SeqNo: 5624249		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	187.6	20	250	6.67	72.4	81-119	172.1	8.63	20	S

The following samples were analyzed in this batch: 1904840-01A 1904840-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **12-Apr-19 09:30**

Work Order: **1904840**

Received by: **DS**

Checklist completed by Diane Shaw 12-Apr-19
eSignature Date

Reviewed by: Chad Whilton 12-Apr-19
eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No
- Sample(s) received on ice? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

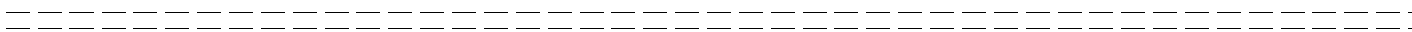
Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:



Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

April 25, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 04/12/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2020
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2020
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10470295
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
837777	A191517-01	Water	04/10/2019	04/12/2019
837776	A191517-02	Water	04/10/2019	04/12/2019

CASE NARRATIVE

Sample Receipt Information:

2 samples were received on 04/12/2019. Samples were received at 2.4 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for multiple compounds for the MDA List 2 analysis. Samples were less than the reporting limit for these analytes so no further action is required.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10470295
Project Manager: Jennifer Anderson

837777

Date Sampled

A191517-01 (Water)

04/10/2019 11:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904180

Acetochlor	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/16/2019	04/23/2019 12:44	EPA 8270D	

Surrogate: Atrazine-d5 106 % 56.9-123 04/16/2019 04/23/2019 12:44 EPA 8270D

Surrogate: Parathion-d10 84.0 % 23.8-169 04/16/2019 04/23/2019 12:44 EPA 8270D

Surrogate: Triphenyl phosphate 108 % 50.5-178 04/16/2019 04/23/2019 12:44 EPA 8270D

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904172

2,4-D	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:01	EPA 8151A	

Surrogate: 2,4-D-d5 94.4 % 43.1-133 04/15/2019 04/20/2019 00:01 EPA 8151A

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10470295
Project Manager: Jennifer Anderson

837776

Date Sampled

A191517-02 (Water)

04/10/2019 13:10

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904180

Acetochlor	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
EPTC	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Phorate	ND	0.30	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Prometon	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Propazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Simazine	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Triallate	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	04/16/2019	04/23/2019 13:12	EPA 8270D	
Surrogate: Atrazine-d5		93.1 %	56.9-123		04/16/2019	04/23/2019 13:12	EPA 8270D	
Surrogate: Parathion-d10		76.4 %	23.8-169		04/16/2019	04/23/2019 13:12	EPA 8270D	
Surrogate: Triphenyl phosphate		96.1 %	50.5-178		04/16/2019	04/23/2019 13:12	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A904172

2,4-D	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
MCPA	ND	0.30	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
Picloram	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	04/15/2019	04/20/2019 00:36	EPA 8151A	
Surrogate: 2,4-D-d5		92.7 %	43.1-133		04/15/2019	04/20/2019 00:36	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10470295
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904180 - EPA 3510C

Blank (A904180-BLK1)

Prepared: 04/16/2019 Analyzed: 04/23/2019 07:31

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							

Surrogate: Atrazine-d5	0.487		ug/L	0.5000		97.4	56.9-123			
Surrogate: Parathion-d10	0.293		ug/L	0.5000		58.5	23.8-169			
Surrogate: Triphenyl phosphate	0.445		ug/L	0.5000		89.0	50.5-178			

LCS (A904180-BS1)

Prepared: 04/16/2019 Analyzed: 04/23/2019 08:00

Acetochlor	0.853	0.50	ug/L	1.000		85.3	67.8-122			
Alachlor	0.837	0.50	ug/L	1.000		83.7	68.6-119			
Atrazine	0.864	0.50	ug/L	1.000		86.4	68.6-115			
Chlorpyrifos	0.788	0.50	ug/L	1.000		78.8	63.1-120			
Cyanazine	0.869	0.20	ug/L	1.000		86.9	55.3-143			
Desethylatrazine	0.811	0.50	ug/L	1.000		81.1	67.8-115			
Deisopropylatrazine	0.596	0.50	ug/L	1.000		59.6	50.1-100			
Dimethenamid	0.850	0.50	ug/L	1.000		85.0	70.3-121			
EPTC	0.652	0.50	ug/L	1.000		65.2	50.4-101			
Ethalfuralin	0.619	0.50	ug/L	1.000		61.9	42.6-121			
Fonofos	0.815	0.50	ug/L	1.000		81.5	56.6-119			
Metolachlor	0.875	0.50	ug/L	1.000		87.5	71.3-128			
Metribuzin	0.825	0.50	ug/L	1.000		82.5	64.9-120			
Pendimethalin	0.770	0.50	ug/L	1.000		77.0	60.9-128			
Phorate	0.636	0.30	ug/L	1.000		63.6	37.3-112			
Prometon	0.814	0.50	ug/L	1.000		81.4	67.1-120			
Propachlor	0.849	0.50	ug/L	1.000		84.9	66.2-127			
Propazine	0.911	0.50	ug/L	1.000		91.1	68.2-118			
Simazine	0.843	0.50	ug/L	1.000		84.3	67.2-117			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10470295
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904180 - EPA 3510C

LCS (A904180-BS1)

Prepared: 04/16/2019 Analyzed: 04/23/2019 08:00

Terbufos	0.574	0.20	ug/L	1.000		57.4	34.3-111			
Triallate	0.666	0.50	ug/L	1.000		66.6	53-121			
Trifluralin	0.567	0.50	ug/L	1.000		56.7	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.475</i>		<i>ug/L</i>	<i>0.5000</i>		<i>94.9</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.386</i>		<i>ug/L</i>	<i>0.5000</i>		<i>77.2</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.448</i>		<i>ug/L</i>	<i>0.5000</i>		<i>89.5</i>	<i>50.5-178</i>			

Matrix Spike (A904180-MS1)

Source: A191601-04

Prepared: 04/16/2019 Analyzed: 04/23/2019 08:28

Acetochlor	1.38	0.50	ug/L	0.9901	0.513	87.0	66.8-131			
Alachlor	1.14	0.50	ug/L	0.9901	0.209	94.4	68.2-133			
Atrazine	1.64	0.50	ug/L	0.9901	0.732	91.3	70-119			
Chlorpyrifos	0.916	0.50	ug/L	0.9901	ND	92.5	64.9-131			
Cyanazine	1.03	0.20	ug/L	0.9901	0.0729	96.4	62.6-155			
Desethylatrazine	0.931	0.50	ug/L	0.9901	0.0781	86.1	63.2-129			
Deisopropylatrazine	0.795	0.50	ug/L	0.9901	ND	80.3	43-119			
Dimethenamid	2.33	0.50	ug/L	0.9901	1.38	95.9	71-132			
EPTC	0.889	0.50	ug/L	0.9901	0.148	74.8	50-110			
Ethalfuralin	0.759	0.50	ug/L	0.9901	ND	76.6	42.9-140			
Fonofos	0.840	0.50	ug/L	0.9901	ND	84.9	52.1-124			
Metolachlor	41.4	10	ug/L	0.9901	47.2	NR	50.8-155			M1, D
Metribuzin	0.912	0.50	ug/L	0.9901	0.0571	86.4	66.7-131			
Pendimethalin	0.935	0.50	ug/L	0.9901	ND	94.5	61.2-152			
Phorate	0.722	0.30	ug/L	0.9901	ND	72.9	42-122			
Prometon	0.917	0.50	ug/L	0.9901	ND	92.6	64.1-135			
Propachlor	0.932	0.50	ug/L	0.9901	ND	94.2	61.4-137			
Propazine	0.930	0.50	ug/L	0.9901	ND	93.9	68.2-126			
Simazine	0.859	0.50	ug/L	0.9901	ND	86.8	68.4-122			
Terbufos	0.721	0.20	ug/L	0.9901	ND	72.8	43.5-119			
Triallate	0.827	0.50	ug/L	0.9901	ND	83.6	58.4-122			
Trifluralin	0.760	0.50	ug/L	0.9901	ND	76.7	51-132			
<i>Surrogate: Atrazine-d5</i>	<i>0.463</i>		<i>ug/L</i>	<i>0.4950</i>		<i>93.6</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.419</i>		<i>ug/L</i>	<i>0.4950</i>		<i>84.7</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.475</i>		<i>ug/L</i>	<i>0.4950</i>		<i>96.0</i>	<i>50.5-178</i>			

Matrix Spike Dup (A904180-MSD1)

Source: A191601-04

Prepared: 04/16/2019 Analyzed: 04/23/2019 08:56

Acetochlor	1.37	0.50	ug/L	0.9901	0.513	86.9	66.8-131	0.126	20	
Alachlor	1.12	0.50	ug/L	0.9901	0.209	91.9	68.2-133	2.17	20	
Atrazine	1.57	0.50	ug/L	0.9901	0.732	84.9	70-119	3.97	20	
Chlorpyrifos	0.928	0.50	ug/L	0.9901	ND	93.8	64.9-131	1.30	20	
Cyanazine	0.990	0.20	ug/L	0.9901	0.0729	92.6	62.6-155	3.76	20	
Desethylatrazine	0.916	0.50	ug/L	0.9901	0.0781	84.7	63.2-129	1.55	20	
Deisopropylatrazine	0.752	0.50	ug/L	0.9901	ND	76.0	43-119	5.45	20	
Dimethenamid	2.29	0.50	ug/L	0.9901	1.38	92.3	71-132	1.52	20	
EPTC	0.875	0.50	ug/L	0.9901	0.148	73.5	50-110	1.50	20	
Ethalfuralin	0.841	0.50	ug/L	0.9901	ND	84.9	42.9-140	10.3	20	
Fonofos	0.843	0.50	ug/L	0.9901	ND	85.1	52.1-124	0.306	20	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10470295
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904180 - EPA 3510C

Matrix Spike Dup (A904180-MSD1)

Source: A191601-04

Prepared: 04/16/2019 Analyzed: 04/23/2019 14:37

Metolachlor	42.6	10	ug/L	0.9901	47.2	NR	50.8-155	2.89	20	M1, D
Metribuzin	0.903	0.50	ug/L	0.9901	0.0571	85.5	66.7-131	0.960	20	
Pendimethalin	0.946	0.50	ug/L	0.9901	ND	95.6	61.2-152	1.16	20	
Phorate	0.755	0.30	ug/L	0.9901	ND	76.3	42-122	4.54	20	
Prometon	0.885	0.50	ug/L	0.9901	ND	89.4	64.1-135	3.57	20	
Propachlor	0.955	0.50	ug/L	0.9901	ND	96.5	61.4-137	2.44	20	
Propazine	0.842	0.50	ug/L	0.9901	ND	85.0	68.2-126	9.98	20	
Simazine	0.872	0.50	ug/L	0.9901	ND	88.1	68.4-122	1.54	20	
Terbufos	0.755	0.20	ug/L	0.9901	ND	76.3	43.5-119	4.63	20	
Triallate	0.812	0.50	ug/L	0.9901	ND	82.1	58.4-122	1.84	20	
Trifluralin	0.752	0.50	ug/L	0.9901	ND	76.0	51-132	1.00	20	
Surrogate: Atrazine-d5	0.473		ug/L	0.4950		95.5	56.9-123			
Surrogate: Parathion-d10	0.410		ug/L	0.4950		82.7	23.8-169			
Surrogate: Triphenyl phosphate	0.448		ug/L	0.4950		90.5	50.5-178			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10470295
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A904172 - EPA 3510C

Blank (A904172-BLK1)

Prepared: 04/15/2019 Analyzed: 04/19/2019 18:46

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
<i>Surrogate: 2,4-D-d5</i>	1.75		ug/L	2.006		87.3	43.1-133			

LCS (A904172-BS1)

Prepared: 04/15/2019 Analyzed: 04/19/2019 19:21

2,4-D	2.10	0.50	ug/L	2.000		105	51.7-152			
2,4-DB	2.17	0.50	ug/L	2.000		109	51.5-146			
2,4,5-T	2.14	0.50	ug/L	2.000		107	55.4-138			
2,4,5-TP (Silvex)	2.09	0.50	ug/L	2.000		105	47.2-152			
Bentazon	0.930	0.50	ug/L	1.000		93.0	48.9-146			
Dicamba	2.11	0.50	ug/L	2.000		105	41-149			
MCPA	2.06	0.30	ug/L	2.000		103	32.6-148			
Picloram	0.770	0.50	ug/L	1.000		77.0	37.8-121			
Triclopyr	2.16	0.50	ug/L	2.000		108	49.9-149			
<i>Surrogate: 2,4-D-d5</i>	1.94		ug/L	2.006		96.8	43.1-133			

LCS Dup (A904172-BSD1)

Prepared: 04/15/2019 Analyzed: 04/19/2019 19:56

2,4-D	1.90	0.50	ug/L	2.000		95.2	51.7-152	9.69	20	
2,4-DB	2.24	0.50	ug/L	2.000		112	51.5-146	3.04	20	
2,4,5-T	2.02	0.50	ug/L	2.000		101	55.4-138	5.87	20	
2,4,5-TP (Silvex)	1.97	0.50	ug/L	2.000		98.5	47.2-152	5.95	20	
Bentazon	0.947	0.50	ug/L	1.000		94.7	48.9-146	1.83	20	
Dicamba	2.13	0.50	ug/L	2.000		106	41-149	0.972	20	
MCPA	2.07	0.30	ug/L	2.000		103	32.6-148	0.242	20	
Picloram	0.807	0.50	ug/L	1.000		80.7	37.8-121	4.69	20	
Triclopyr	2.04	0.50	ug/L	2.000		102	49.9-149	5.94	20	
<i>Surrogate: 2,4-D-d5</i>	1.76		ug/L	2.006		87.7	43.1-133			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10470295
Project Manager: Jennifer Anderson

Notes and Definitions

- M1 Spike recoveries were not evaluated because of elevated levels of the spiked analyte in the parent sample.
- D Data reported from a dilution
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

June 12, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10475854

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on May 21, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
Alaska Certification UST-107
Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683

Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10475854001	472759	Water	05/21/19 10:45	05/21/19 16:00
10475854002	603286	Water	05/21/19 12:50	05/21/19 16:00
10475854003	603284	Water	05/21/19 14:20	05/21/19 16:00
10475854004	603283	Water	05/21/19 15:40	05/21/19 16:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10475854001	472759	EPA 8082A	RAG	11	PASI-M		
		EPA 200.7	DM	9	PASI-M		
		EPA 200.8	PW1	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	CLA	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	KEO	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10475854002	603286	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
EPA 200.8	BWB, PW1			12	PASI-M		
EPA 8270D	STB			38	PASI-M		
	CLJ			16	PASI-V		
EPA 900.0	CLA			2	PASI-PA		
EPA 300.0	KEO			1	PASI-M		
SM 3500-Cr B Modified	KEO			1	PASI-M		
EPA 350.1	CLJ			1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V		
SM 4500-CN-E	DCL			1	PASI-M		
10475854003	603284			EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
		EPA 200.8	BWB, PW1	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	CLA	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	KEO	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10475854004	603283	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
EPA 200.8	BWB, PW1			12	PASI-M		
EPA 8270D	STB			38	PASI-M		

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
			CLJ	16	PASI-V
		EPA 900.0	CLA	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	KEO	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 472759	Lab ID: 10475854001	Collected: 05/21/19 10:45	Received: 05/21/19 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.095	1	05/22/19 17:24	05/24/19 10:32	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	54	%	30-125	1	05/22/19 17:24	05/24/19 10:32	877-09-8	
Decachlorobiphenyl (S)	104	%	30-125	1	05/22/19 17:24	05/24/19 10:32	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	05/28/19 15:31	05/29/19 09:49	7429-90-5	
Barium, Dissolved	25.9	ug/L	10.0	1	05/28/19 15:31	05/29/19 09:49	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	05/28/19 15:31	05/29/19 09:49	7440-50-8	
Manganese, Dissolved	1020	ug/L	5.0	1	05/28/19 15:31	05/29/19 09:49	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	05/28/19 15:31	05/29/19 09:49	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	05/28/19 15:31	05/29/19 09:49	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	05/28/19 15:31	05/29/19 09:49	7440-31-5	
Total Hardness by 2340B, Dissolved	983000	ug/L	3300	1	05/28/19 15:31	05/29/19 09:49		
Zinc, Dissolved	ND	ug/L	20.0	1	05/28/19 15:31	05/29/19 09:49	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 10:39	7440-36-0	
Arsenic, Dissolved	8.8	ug/L	0.50	1	06/03/19 10:23	06/05/19 10:39	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/03/19 10:23	06/05/19 10:39	7440-41-7	
Boron, Dissolved	4480	ug/L	1000	100	06/03/19 10:23	06/05/19 10:48	7440-42-8	
Cadmium, Dissolved	0.16	ug/L	0.080	1	06/03/19 10:23	06/05/19 10:39	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 10:39	7440-47-3	
Cobalt, Dissolved	3.0	ug/L	0.50	1	06/03/19 10:23	06/05/19 10:39	7440-48-4	
Lead, Dissolved	0.18	ug/L	0.10	1	06/03/19 10:23	06/05/19 10:39	7439-92-1	
Selenium, Dissolved	0.97	ug/L	0.50	1	06/03/19 10:23	06/05/19 10:39	7782-49-2	
Thallium, Dissolved	0.13	ug/L	0.10	1	06/03/19 10:23	06/05/19 10:39	7440-28-0	
Uranium, Dissolved	4.7	ug/L	0.50	1	06/03/19 10:23	06/05/19 10:39	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/03/19 10:23	06/05/19 10:39	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	83-32-9	
Anthracene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	50-32-8	
Benzoic acid	ND	ug/L	50.8	1	05/22/19 19:09	05/31/19 15:12	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 472759 **Lab ID: 10475854001** Collected: 05/21/19 10:45 Received: 05/21/19 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	50.8	1	05/22/19 19:09	05/31/19 15:12	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	120-83-2	
Diethylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	105-67-9	
Dimethylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	117-81-7	
Fluoranthene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	206-44-0	
Fluorene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	86-73-7	
Hexachlorobenzene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	50.8	1	05/22/19 19:09	05/31/19 15:12	77-47-4	
Hexachloroethane	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	67-72-1	
Isophorone	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12		
N-Nitrosodimethylamine	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	62-75-9	
Pentachlorophenol	ND	ug/L	20.3	1	05/22/19 19:09	05/31/19 15:12	87-86-5	
Phenanthrene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	85-01-8	
Phenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	108-95-2	
Pyrene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:12	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	76	%	55-125	1	05/22/19 19:09	05/31/19 15:12	4165-60-0	
2-Fluorobiphenyl (S)	68	%	52-125	1	05/22/19 19:09	05/31/19 15:12	321-60-8	
p-Terphenyl-d14 (S)	95	%	57-125	1	05/22/19 19:09	05/31/19 15:12	1718-51-0	
Phenol-d6 (S)	76	%	30-125	1	05/22/19 19:09	05/31/19 15:12	13127-88-3	
2-Fluorophenol (S)	70	%	30-125	1	05/22/19 19:09	05/31/19 15:12	367-12-4	
2,4,6-Tribromophenol (S)	97	%	52-125	1	05/22/19 19:09	05/31/19 15:12	118-79-6	

Field Data

Analytical Method:

Collected Date	05/21/19			1		05/21/19 10:45		
Collected Time	1045			1		05/21/19 10:45		
Field pH	6.2	Std. Units		1		05/21/19 10:45		
Field Temperature	9.0	deg C		1		05/21/19 10:45		
Field Specific Conductance	1850	umhos/cm		1		05/21/19 10:45		
Oxygen, Dissolved	0.8	mg/L		1		05/21/19 10:45	7782-44-7	
REDOX	-35	mV		1		05/21/19 10:45		
Turbidity	9.9	NTU		1		05/21/19 10:45		
Apparent Color	Clear			1		05/21/19 10:45		
Odor	No			1		05/21/19 10:45		
Well Locked	Yes			1		05/21/19 10:45		
Purge Method	Dual Whale Pump			1		05/21/19 10:45		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 472759		Lab ID: 10475854001		Collected: 05/21/19 10:45	Received: 05/21/19 16:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Total Well Depth	23.20	feet		1		05/21/19 10:45		
Depth of Water	5.19			1		05/21/19 10:45		
Well Volume Purged	9.0			1		05/21/19 10:45		
Purge Rate	0.5			1		05/21/19 10:45		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	49.5	mg/L	1.2	1		05/24/19 14:36	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		05/22/19 07:23		M1
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/05/19 11:23		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	0.18	mg/L	0.11	1	05/28/19 09:43	05/29/19 12:56	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	06/04/19 08:53	06/04/19 15:16	57-12-5	

Sample: 603286		Lab ID: 10475854002		Collected: 05/21/19 12:50	Received: 05/21/19 16:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	05/22/19 17:24	05/24/19 10:47	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	77	%	30-125	1	05/22/19 17:24	05/24/19 10:47	877-09-8	
Decachlorobiphenyl (S)	97	%	30-125	1	05/22/19 17:24	05/24/19 10:47	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	06/03/19 10:23	06/04/19 11:56	7429-90-5	
Barium, Dissolved	25.9	ug/L	10.0	1	06/03/19 10:23	06/04/19 11:56	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 11:56	7440-50-8	
Manganese, Dissolved	244	ug/L	5.0	1	06/03/19 10:23	06/04/19 11:56	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 11:56	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 11:56	7440-22-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 603286	Lab ID: 10475854002	Collected: 05/21/19 12:50	Received: 05/21/19 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	06/03/19 10:23	06/04/19 11:56	7440-31-5	
Total Hardness by 2340B, Dissolved	811000	ug/L	3300	1	06/03/19 10:23	06/04/19 11:56		
Zinc, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 11:56	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:06	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:06	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/03/19 10:23	06/05/19 11:06	7440-41-7	
Boron, Dissolved	690	ug/L	100	10	06/03/19 10:23	06/07/19 12:04	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	06/03/19 10:23	06/05/19 11:06	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:06	7440-47-3	
Cobalt, Dissolved	0.66	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:06	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:06	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:06	7782-49-2	
Thallium, Dissolved	0.48	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:06	7440-28-0	
Uranium, Dissolved	6.7	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:06	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/03/19 10:23	06/05/19 11:06	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	83-32-9	
Anthracene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	50-32-8	
Benzoic acid	ND	ug/L	51.0	1	05/22/19 19:09	05/31/19 15:39	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	111-44-4	
2-Chlorophenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.0	1	05/22/19 19:09	05/31/19 15:39	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	120-83-2	
Diethylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	105-67-9	
Dimethylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	117-81-7	
Fluoranthene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	206-44-0	
Fluorene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	86-73-7	
Hexachlorobenzene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.0	1	05/22/19 19:09	05/31/19 15:39	77-47-4	
Hexachloroethane	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	67-72-1	
Isophorone	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39		
N-Nitrosodimethylamine	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 603286	Lab ID: 10475854002	Collected: 05/21/19 12:50	Received: 05/21/19 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Pentachlorophenol	ND	ug/L	20.4	1	05/22/19 19:09	05/31/19 15:39	87-86-5	
Phenanthrene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	85-01-8	
Phenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	108-95-2	
Pyrene	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.2	1	05/22/19 19:09	05/31/19 15:39	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	74	%.	55-125	1	05/22/19 19:09	05/31/19 15:39	4165-60-0	
2-Fluorobiphenyl (S)	68	%.	52-125	1	05/22/19 19:09	05/31/19 15:39	321-60-8	
p-Terphenyl-d14 (S)	91	%.	57-125	1	05/22/19 19:09	05/31/19 15:39	1718-51-0	
Phenol-d6 (S)	73	%.	30-125	1	05/22/19 19:09	05/31/19 15:39	13127-88-3	
2-Fluorophenol (S)	69	%.	30-125	1	05/22/19 19:09	05/31/19 15:39	367-12-4	
2,4,6-Tribromophenol (S)	94	%.	52-125	1	05/22/19 19:09	05/31/19 15:39	118-79-6	
Field Data		Analytical Method:						
Collected Date	05/21/19			1		05/21/19 12:50		
Collected Time	1250			1		05/21/19 12:50		
Field pH	6.9	Std. Units		1		05/21/19 12:50		
Field Temperature	7.5	deg C		1		05/21/19 12:50		
Field Specific Conductance	1400	umhos/cm		1		05/21/19 12:50		
Oxygen, Dissolved	0.1	mg/L		1		05/21/19 12:50	7782-44-7	
REDOX	-17	mV		1		05/21/19 12:50		
Turbidity	11.4	NTU		1		05/21/19 12:50		
Apparent Color	Clear			1		05/21/19 12:50		
Odor	No			1		05/21/19 12:50		
Well Locked	Yes			1		05/21/19 12:50		
Purge Method	Dual Whale Pump			1		05/21/19 12:50		
Total Well Depth	23.22	feet		1		05/21/19 12:50		
Depth of Water	5.94			1		05/21/19 12:50		
Well Volume Purged	36.0			1		05/21/19 12:50		
Purge Rate	1.0			1		05/21/19 12:50		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	34.2	mg/L	1.2	1		05/24/19 14:51	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		05/22/19 07:23		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/05/19 11:24		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	0.12	mg/L	0.11	1	05/28/19 09:43	05/29/19 12:57	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	06/04/19 08:53	06/04/19 15:19	57-12-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 603284	Lab ID: 10475854003	Collected: 05/21/19 14:20	Received: 05/21/19 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.096	1	05/22/19 17:24	05/24/19 11:03	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	67	%	30-125	1	05/22/19 17:24	05/24/19 11:03	877-09-8	
Decachlorobiphenyl (S)	118	%	30-125	1	05/22/19 17:24	05/24/19 11:03	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	06/03/19 10:23	06/04/19 12:01	7429-90-5	
Barium, Dissolved	36.6	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:01	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:01	7440-50-8	
Manganese, Dissolved	ND	ug/L	5.0	1	06/03/19 10:23	06/04/19 12:01	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:01	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:01	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	06/03/19 10:23	06/04/19 12:01	7440-31-5	
Total Hardness by 2340B, Dissolved	616000	ug/L	3300	1	06/03/19 10:23	06/04/19 12:01		
Zinc, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:01	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:12	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:12	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/03/19 10:23	06/05/19 11:12	7440-41-7	
Boron, Dissolved	10500	ug/L	1000	100	06/03/19 10:23	06/06/19 16:03	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	06/03/19 10:23	06/05/19 11:12	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:12	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:12	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:12	7439-92-1	
Selenium, Dissolved	15.7	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:12	7782-49-2	
Thallium, Dissolved	0.11	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:12	7440-28-0	
Uranium, Dissolved	6.9	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:12	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/03/19 10:23	06/05/19 11:12	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	83-32-9	
Anthracene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	50-32-8	
Benzoic acid	ND	ug/L	51.5	1	05/22/19 19:09	05/31/19 16:06	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 603284 **Lab ID: 10475854003** Collected: 05/21/19 14:20 Received: 05/21/19 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
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8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.5	1	05/22/19 19:09	05/31/19 16:06	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	120-83-2	
Diethylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	105-67-9	
Dimethylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	117-81-7	
Fluoranthene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	206-44-0	
Fluorene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	86-73-7	
Hexachlorobenzene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.5	1	05/22/19 19:09	05/31/19 16:06	77-47-4	
Hexachloroethane	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	67-72-1	
Isophorone	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06		
N-Nitrosodimethylamine	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	62-75-9	
Pentachlorophenol	ND	ug/L	20.6	1	05/22/19 19:09	05/31/19 16:06	87-86-5	
Phenanthrene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	85-01-8	
Phenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	108-95-2	
Pyrene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:06	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	64	%	55-125	1	05/22/19 19:09	05/31/19 16:06	4165-60-0	
2-Fluorobiphenyl (S)	57	%	52-125	1	05/22/19 19:09	05/31/19 16:06	321-60-8	
p-Terphenyl-d14 (S)	76	%	57-125	1	05/22/19 19:09	05/31/19 16:06	1718-51-0	
Phenol-d6 (S)	62	%	30-125	1	05/22/19 19:09	05/31/19 16:06	13127-88-3	
2-Fluorophenol (S)	60	%	30-125	1	05/22/19 19:09	05/31/19 16:06	367-12-4	
2,4,6-Tribromophenol (S)	73	%	52-125	1	05/22/19 19:09	05/31/19 16:06	118-79-6	

Field Data

Analytical Method:

Collected Date	05/21/19			1		05/21/19 14:20		
Collected Time	1420			1		05/21/19 14:20		
Field pH	6.9	Std. Units		1		05/21/19 14:20		
Field Temperature	8.0	deg C		1		05/21/19 14:20		
Field Specific Conductance	1240	umhos/cm		1		05/21/19 14:20		
Oxygen, Dissolved	4.7	mg/L		1		05/21/19 14:20	7782-44-7	
REDOX	106	mV		1		05/21/19 14:20		
Turbidity	7.4	NTU		1		05/21/19 14:20		
Apparent Color	Clear			1		05/21/19 14:20		
Odor	No			1		05/21/19 14:20		
Well Locked	Yes			1		05/21/19 14:20		
Purge Method	Whale Pump			1		05/21/19 14:20		

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 603284		Lab ID: 10475854003		Collected: 05/21/19 14:20	Received: 05/21/19 16:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Total Well Depth	20.99	feet		1		05/21/19 14:20		
Depth of Water	5.89			1		05/21/19 14:20		
Well Volume Purged	70.2			1		05/21/19 14:20		
Purge Rate	1.35			1		05/21/19 14:20		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	72.7	mg/L	1.2	1		05/24/19 15:06	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		05/22/19 07:23		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/05/19 11:24		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	ND	mg/L	0.11	1	05/28/19 09:43	05/29/19 12:59	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	06/04/19 08:53	06/04/19 15:23	57-12-5	

Sample: 603283		Lab ID: 10475854004		Collected: 05/21/19 15:40	Received: 05/21/19 16:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.10	1	05/22/19 17:24	05/24/19 11:18	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	63	%	30-125	1	05/22/19 17:24	05/24/19 11:18	877-09-8	
Decachlorobiphenyl (S)	91	%	30-125	1	05/22/19 17:24	05/24/19 11:18	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	06/03/19 10:23	06/04/19 12:03	7429-90-5	
Barium, Dissolved	25.0	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:03	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:03	7440-50-8	
Manganese, Dissolved	170	ug/L	5.0	1	06/03/19 10:23	06/04/19 12:03	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:03	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:03	7440-22-4	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 603283	Lab ID: 10475854004	Collected: 05/21/19 15:40	Received: 05/21/19 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Tin, Dissolved	ND	ug/L	75.0	1	06/03/19 10:23	06/04/19 12:03	7440-31-5	
Total Hardness by 2340B, Dissolved	1060000	ug/L	3300	1	06/03/19 10:23	06/04/19 12:03		
Zinc, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:03	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	2.8	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:18	7440-36-0	
Arsenic, Dissolved	2.5	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:18	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/03/19 10:23	06/05/19 11:18	7440-41-7	
Boron, Dissolved	52800	ug/L	2500	250	06/03/19 10:23	06/06/19 16:06	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	06/03/19 10:23	06/05/19 11:18	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:18	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:18	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:18	7439-92-1	
Selenium, Dissolved	55.0	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:18	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:18	7440-28-0	
Uranium, Dissolved	46.9	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:18	7440-61-1	
Vanadium, Dissolved	14.0	ug/L	1.0	1	06/03/19 10:23	06/05/19 11:18	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	83-32-9	
Anthracene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	50-32-8	
Benzoic acid	ND	ug/L	51.5	1	05/22/19 19:09	05/31/19 16:33	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	111-44-4	
2-Chlorophenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	51.5	1	05/22/19 19:09	05/31/19 16:33	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	120-83-2	
Diethylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	105-67-9	
Dimethylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	117-81-7	
Fluoranthene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	206-44-0	
Fluorene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	86-73-7	
Hexachlorobenzene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	51.5	1	05/22/19 19:09	05/31/19 16:33	77-47-4	
Hexachloroethane	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	67-72-1	
Isophorone	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33		
N-Nitrosodimethylamine	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	62-75-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 603283	Lab ID: 10475854004	Collected: 05/21/19 15:40	Received: 05/21/19 16:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Pentachlorophenol	ND	ug/L	20.6	1	05/22/19 19:09	05/31/19 16:33	87-86-5	
Phenanthrene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	85-01-8	
Phenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	108-95-2	
Pyrene	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.3	1	05/22/19 19:09	05/31/19 16:33	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	76	%	55-125	1	05/22/19 19:09	05/31/19 16:33	4165-60-0	
2-Fluorobiphenyl (S)	70	%	52-125	1	05/22/19 19:09	05/31/19 16:33	321-60-8	
p-Terphenyl-d14 (S)	88	%	57-125	1	05/22/19 19:09	05/31/19 16:33	1718-51-0	
Phenol-d6 (S)	72	%	30-125	1	05/22/19 19:09	05/31/19 16:33	13127-88-3	
2-Fluorophenol (S)	68	%	30-125	1	05/22/19 19:09	05/31/19 16:33	367-12-4	
2,4,6-Tribromophenol (S)	90	%	52-125	1	05/22/19 19:09	05/31/19 16:33	118-79-6	
Field Data								
Analytical Method:								
Collected Date	05/21/19			1		05/21/19 15:40		
Collected Time	1540			1		05/21/19 15:40		
Field pH	8.7	Std. Units		1		05/21/19 15:40		
Field Temperature	9.5	deg C		1		05/21/19 15:40		
Field Specific Conductance	2110	umhos/cm		1		05/21/19 15:40		
Oxygen, Dissolved	2.7	mg/L		1		05/21/19 15:40	7782-44-7	
REDOX	-90	mV		1		05/21/19 15:40		
Turbidity	170	NTU		1		05/21/19 15:40		
Apparent Color	Clear			1		05/21/19 15:40		
Odor	No			1		05/21/19 15:40		
Well Locked	Yes			1		05/21/19 15:40		
Purge Method	Whale Pump			1		05/21/19 15:40		
Total Well Depth	29.55	feet		1		05/21/19 15:40		
Depth of Water	11.20			1		05/21/19 15:40		
Well Volume Purged	81.9			1		05/21/19 15:40		
Purge Rate	1.3			1		05/21/19 15:40		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	66.5	mg/L	1.2	1		05/24/19 15:21	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		05/22/19 07:23		
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	0.063	mg/L	0.010	1		06/05/19 11:24		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	0.77	mg/L	0.11	1	05/28/19 09:43	05/29/19 13:00	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	06/04/19 08:53	06/04/19 15:24	57-12-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10475854

QC Batch: 608670 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10475854001

METHOD BLANK: 3290018 Matrix: Water
Associated Lab Samples: 10475854001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	05/29/19 09:23	
Barium, Dissolved	ug/L	ND	10.0	05/29/19 09:23	
Copper, Dissolved	ug/L	ND	10.0	05/29/19 09:23	
Manganese, Dissolved	ug/L	ND	5.0	05/29/19 09:23	
Nickel, Dissolved	ug/L	ND	20.0	05/29/19 09:23	
Silver, Dissolved	ug/L	ND	10.0	05/29/19 09:23	
Tin, Dissolved	ug/L	ND	75.0	05/29/19 09:23	
Zinc, Dissolved	ug/L	ND	20.0	05/29/19 09:23	

LABORATORY CONTROL SAMPLE: 3290019

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21700	108	85-115	
Barium, Dissolved	ug/L	1000	1030	103	85-115	
Copper, Dissolved	ug/L	1000	997	100	85-115	
Manganese, Dissolved	ug/L	1000	1040	104	85-115	
Nickel, Dissolved	ug/L	1000	1010	101	85-115	
Silver, Dissolved	ug/L	500	509	102	85-115	
Tin, Dissolved	ug/L	1000	998	100	85-115	
Zinc, Dissolved	ug/L	1000	1030	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3290020 3290021

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10476012001 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum, Dissolved	ug/L	ND	20000	20000	21500	22000	107	110	70-130	2	20		
Barium, Dissolved	ug/L	19.0	1000	1000	1030	1050	101	103	70-130	2	20		
Copper, Dissolved	ug/L	ND	1000	1000	1010	1020	100	102	70-130	2	20		
Manganese, Dissolved	ug/L	ND	1000	1000	1020	1040	102	104	70-130	2	20		
Nickel, Dissolved	ug/L	ND	1000	1000	981	994	98	99	70-130	1	20		
Silver, Dissolved	ug/L	ND	500	500	512	521	102	104	70-130	2	20		
Tin, Dissolved	ug/L	ND	1000	1000	979	999	98	100	70-130	2	20		
Zinc, Dissolved	ug/L	59.2	1000	1000	1050	1070	99	101	70-130	2	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10475854

QC Batch: 609218 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10475854002, 10475854003, 10475854004

METHOD BLANK: 3292563 Matrix: Water
Associated Lab Samples: 10475854002, 10475854003, 10475854004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	06/04/19 11:53	
Barium, Dissolved	ug/L	ND	10.0	06/04/19 11:53	
Copper, Dissolved	ug/L	ND	10.0	06/04/19 11:53	
Manganese, Dissolved	ug/L	ND	5.0	06/04/19 11:53	
Nickel, Dissolved	ug/L	ND	20.0	06/04/19 11:53	
Silver, Dissolved	ug/L	ND	10.0	06/04/19 11:53	
Tin, Dissolved	ug/L	ND	75.0	06/04/19 11:53	
Zinc, Dissolved	ug/L	ND	20.0	06/04/19 11:53	

LABORATORY CONTROL SAMPLE: 3292564

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21200	106	85-115	
Barium, Dissolved	ug/L	1000	1020	102	85-115	
Copper, Dissolved	ug/L	1000	976	98	85-115	
Manganese, Dissolved	ug/L	1000	1020	102	85-115	
Nickel, Dissolved	ug/L	1000	1000	100	85-115	
Silver, Dissolved	ug/L	500	502	100	85-115	
Tin, Dissolved	ug/L	1000	1000	100	85-115	
Zinc, Dissolved	ug/L	1000	1020	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292565 3292566

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10475854002 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	22200	22000	111	110	70-130	1	20
Barium, Dissolved	ug/L	25.9	1000	1000	1050	1040	102	102	70-130	1	20
Copper, Dissolved	ug/L	ND	1000	1000	1020	1010	102	101	70-130	1	20
Manganese, Dissolved	ug/L	244	1000	1000	1270	1270	103	103	70-130	0	20
Nickel, Dissolved	ug/L	ND	1000	1000	980	972	98	97	70-130	1	20
Silver, Dissolved	ug/L	ND	500	500	528	522	106	104	70-130	1	20
Tin, Dissolved	ug/L	ND	1000	1000	1000	978	100	98	70-130	2	20
Zinc, Dissolved	ug/L	ND	1000	1000	990	983	99	98	70-130	1	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

QC Batch: 609219 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

METHOD BLANK: 3292568 Matrix: Water
Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Arsenic, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Beryllium, Dissolved	ug/L	ND	0.20	06/05/19 09:44	
Boron, Dissolved	ug/L	ND	10.0	06/05/19 09:44	
Cadmium, Dissolved	ug/L	ND	0.080	06/05/19 09:44	
Chromium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Cobalt, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Lead, Dissolved	ug/L	ND	0.10	06/05/19 09:44	
Selenium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Thallium, Dissolved	ug/L	ND	0.10	06/05/19 09:44	
Uranium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Vanadium, Dissolved	ug/L	ND	1.0	06/05/19 09:44	

LABORATORY CONTROL SAMPLE: 3292569

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	106	106	85-115	
Arsenic, Dissolved	ug/L	100	101	101	85-115	
Beryllium, Dissolved	ug/L	100	94.2	94	85-115	
Boron, Dissolved	ug/L	100	99.9	100	85-115	
Cadmium, Dissolved	ug/L	100	101	101	85-115	
Chromium, Dissolved	ug/L	100	102	102	85-115	
Cobalt, Dissolved	ug/L	100	104	104	85-115	
Lead, Dissolved	ug/L	100	104	104	85-115	
Selenium, Dissolved	ug/L	100	112	112	85-115	
Thallium, Dissolved	ug/L	100	111	111	85-115	
Uranium, Dissolved	ug/L	100	98.2	98	85-115	
Vanadium, Dissolved	ug/L	100	99.8	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292570 3292571

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10476128001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony, Dissolved	ug/L	ND	100	100	108	108	107	108	70-130	1	20	
Arsenic, Dissolved	ug/L	ND	100	100	102	102	101	102	70-130	1	20	
Beryllium, Dissolved	ug/L	ND	100	100	96.3	96.0	96	96	70-130	0	20	
Boron, Dissolved	ug/L	77.5	100	100	167	168	89	90	70-130	1	20	
Cadmium, Dissolved	ug/L	0.13	100	100	95.8	97.8	96	98	70-130	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292570												3292571	
Parameter	Units	10476128001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Chromium, Dissolved	ug/L	ND	100	100	108	109	108	109	70-130	1	20		
Cobalt, Dissolved	ug/L	ND	100	100	104	105	104	105	70-130	1	20		
Lead, Dissolved	ug/L	0.11	100	100	95.6	96.7	96	97	70-130	1	20		
Selenium, Dissolved	ug/L	2.7	100	100	114	116	111	113	70-130	2	20		
Thallium, Dissolved	ug/L	0.11	100	100	103	104	103	104	70-130	1	20		
Uranium, Dissolved	ug/L	11.5	100	100	111	110	99	98	70-130	1	20		
Vanadium, Dissolved	ug/L	ND	100	100	111	113	110	112	70-130	1	20		

MATRIX SPIKE SAMPLE: 3292572									
Parameter	Units	10476128003	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	105	105	70-130			
Arsenic, Dissolved	ug/L	ND	100	101	101	70-130			
Beryllium, Dissolved	ug/L	ND	100	97.9	98	70-130			
Boron, Dissolved	ug/L	13.2	100	116	103	70-130			
Cadmium, Dissolved	ug/L	ND	100	99.9	100	70-130			
Chromium, Dissolved	ug/L	ND	100	104	104	70-130			
Cobalt, Dissolved	ug/L	ND	100	105	105	70-130			
Lead, Dissolved	ug/L	ND	100	102	102	70-130			
Selenium, Dissolved	ug/L	ND	100	110	110	70-130			
Thallium, Dissolved	ug/L	ND	100	108	108	70-130			
Uranium, Dissolved	ug/L	ND	100	98.1	98	70-130			
Vanadium, Dissolved	ug/L	ND	100	103	103	70-130			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

QC Batch: 607602 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

METHOD BLANK: 3284566 Matrix: Water
Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	05/24/19 09:32	
Decachlorobiphenyl (S)	%	117	30-125	05/24/19 09:32	
Tetrachloro-m-xylene (S)	%	53	30-125	05/24/19 09:32	

LABORATORY CONTROL SAMPLE & LCSD: 3284567

3284568

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.6	81	82	45-125	1	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.8	1.8	90	91	49-125	0	20	
Decachlorobiphenyl (S)	%				126	125	30-125			S0
Tetrachloro-m-xylene (S)	%				72	75	30-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

QC Batch: 607604 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

METHOD BLANK: 3284579 Matrix: Water
Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	05/30/19 13:45	
2,4-Dichlorophenol	ug/L	ND	10.0	05/30/19 13:45	
2,4-Dimethylphenol	ug/L	ND	10.0	05/30/19 13:45	
2,4-Dinitrophenol	ug/L	ND	10.0	05/30/19 13:45	
2-Chlorophenol	ug/L	ND	10.0	05/30/19 13:45	
2-Methylnaphthalene	ug/L	ND	10.0	05/30/19 13:45	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	05/30/19 13:45	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	10.0	05/30/19 13:45	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	05/30/19 13:45	
4-Bromophenylphenyl ether	ug/L	ND	10.0	05/30/19 13:45	
Acenaphthene	ug/L	ND	10.0	05/30/19 13:45	
Anthracene	ug/L	ND	10.0	05/30/19 13:45	
Benzo(a)pyrene	ug/L	ND	10.0	05/30/19 13:45	
Benzoic acid	ug/L	ND	50.0	05/30/19 13:45	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	05/30/19 13:45	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	05/30/19 13:45	
Butylbenzylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Di-n-butylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Di-n-octylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Diethylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Dimethylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Fluoranthene	ug/L	ND	10.0	05/30/19 13:45	
Fluorene	ug/L	ND	10.0	05/30/19 13:45	
Hexachlorobenzene	ug/L	ND	10.0	05/30/19 13:45	
Hexachlorocyclopentadiene	ug/L	ND	50.0	05/30/19 13:45	
Hexachloroethane	ug/L	ND	10.0	05/30/19 13:45	
Isophorone	ug/L	ND	10.0	05/30/19 13:45	
N-Nitrosodimethylamine	ug/L	ND	10.0	05/30/19 13:45	
Pentachlorophenol	ug/L	ND	20.0	05/30/19 13:45	
Phenanthrene	ug/L	ND	10.0	05/30/19 13:45	
Phenol	ug/L	ND	10.0	05/30/19 13:45	
Pyrene	ug/L	ND	10.0	05/30/19 13:45	
2,4,6-Tribromophenol (S)	%	87	52-125	05/30/19 13:45	
2-Fluorobiphenyl (S)	%	69	52-125	05/30/19 13:45	
2-Fluorophenol (S)	%	62	30-125	05/30/19 13:45	
Nitrobenzene-d5 (S)	%	66	55-125	05/30/19 13:45	
p-Terphenyl-d14 (S)	%	90	57-125	05/30/19 13:45	
Phenol-d6 (S)	%	61	30-125	05/30/19 13:45	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

LABORATORY CONTROL SAMPLE & LCSD: 3284580

3284581

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	43.9	44.6	88	89	60-125	2	20	
2,4-Dichlorophenol	ug/L	50	40.8	40.8	82	82	56-125	0	20	
2,4-Dimethylphenol	ug/L	50	36.5	36.6	73	73	33-125	0	20	
2,4-Dinitrophenol	ug/L	50	43.8	43.9	88	88	32-125	0	20	
2-Chlorophenol	ug/L	50	36.5	38.0	73	76	52-125	4	20	
2-Methylnaphthalene	ug/L	50	40.5	41.2	81	82	52-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	37.5	37.8	75	76	55-125	1	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	38.6	38.3	77	77	57-125	1	20	
3,3'-Dichlorobenzidine	ug/L	50	47.2J	50.3	94	101	39-150		20	
4-Bromophenylphenyl ether	ug/L	50	45.0	45.6	90	91	61-125	1	20	
Acenaphthene	ug/L	50	42.7	43.5	85	87	59-125	2	20	
Anthracene	ug/L	50	44.0	45.0	88	90	64-125	2	20	
Benzo(a)pyrene	ug/L	50	44.9	46.3	90	93	63-125	3	20	
Benzoic acid	ug/L	50	31.4J	24.3J	63	49	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	34.9	35.8	70	72	49-125	3	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	43.8	44.6	88	89	68-125	2	20	
Butylbenzylphthalate	ug/L	50	44.2	45.8	88	92	67-125	4	20	
Di-n-butylphthalate	ug/L	50	43.8	45.4	88	91	67-125	4	20	
Di-n-octylphthalate	ug/L	50	43.2	44.5	86	89	67-125	3	20	
Diethylphthalate	ug/L	50	44.2	45.8	88	92	64-125	3	20	
Dimethylphthalate	ug/L	50	44.6	45.2	89	90	65-125	2	20	
Fluoranthene	ug/L	50	44.1	45.0	88	90	64-125	2	20	
Fluorene	ug/L	50	43.3	44.1	87	88	63-125	2	20	
Hexachlorobenzene	ug/L	50	44.9	45.7	90	91	61-125	2	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	39	37	30-125		20	1M
Hexachloroethane	ug/L	50	32.0	33.0	64	66	30-125	3	20	
Isophorone	ug/L	50	41.7	42.7	83	85	59-125	2	20	
N-Nitrosodimethylamine	ug/L	50	34.4	35.1	69	70	43-125	2	20	
Pentachlorophenol	ug/L	50	39.7	38.2	79	76	35-125	4	20	
Phenanthrene	ug/L	50	43.9	44.2	88	88	65-125	1	20	
Phenol	ug/L	50	36.7	37.5	73	75	54-125	2	20	
Pyrene	ug/L	50	43.5	45.5	87	91	65-125	5	20	
2,4,6-Tribromophenol (S)	%				95	98	52-125			
2-Fluorobiphenyl (S)	%				77	76	52-125			
2-Fluorophenol (S)	%				68	70	30-125			
Nitrobenzene-d5 (S)	%				74	75	55-125			
p-Terphenyl-d14 (S)	%				90	92	57-125			
Phenol-d6 (S)	%				72	73	30-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10475854

QC Batch: 607680 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

METHOD BLANK: 3284982 Matrix: Water
Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	05/24/19 03:02	

LABORATORY CONTROL SAMPLE: 3284983

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3284984 3284985

Parameter	Units	10475846001		10475846002		10475846003		10475846004		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result					
Chloride	mg/L	144	125	125	272	271	102	101	90-110	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3284986 3284987

Parameter	Units	10475846002		10475846003		10475846004		10475846001		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result					
Chloride	mg/L	17.9	12.5	12.5	28.9	29.4	88	91	90-110	1	20	M1	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

QC Batch: 607489 Analysis Method: SM 3500-Cr B Modified
 QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
 Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

METHOD BLANK: 3284059 Matrix: Water
 Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	05/22/19 07:23	

LABORATORY CONTROL SAMPLE: 3284060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3284061 3284062

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10475854001 Result	Spike Conc.	Spike Conc.	Result						
Chromium, Hexavalent	mg/L	ND	0.2	0.2	0.12	0.12	60	61	85-115	1	20 M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

QC Batch: 166887 Analysis Method: EPA 350.1 rev. 2 (1993)
 QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
 Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

METHOD BLANK: 657660 Matrix: Water
 Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	05/29/19 12:51	

LABORATORY CONTROL SAMPLE: 657661

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 657662 657663

Parameter	Units	12125357002		MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	4.1	5	5	5	8.7	8.7	92	93	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 657664 657665

Parameter	Units	12125430002		MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	0.14	5	5	5	5.3	5.2	103	102	90-110	0	10	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

QC Batch: 610208

Analysis Method: SM 4500-CN-E

QC Batch Method: SM 4500-CN-E

Analysis Description: SM4500CN-E Cyanide

Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

METHOD BLANK: 3297765

Matrix: Water

Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	06/04/19 15:15	

LABORATORY CONTROL SAMPLE: 3297766

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	252	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3297767 3297768

Parameter	Units	10475854001		10475854002		10475854003		10475854004		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Cyanide	ug/L	ND	250	250	239	243	92	94	80-120	1	30		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3297769 3297770

Parameter	Units	10475854002		10475854003		10475854004		10475854001		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Cyanide	ug/L	ND	250	250	251	261	94	98	80-120	4	30		

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Sample: 472759		Lab ID: 10475854001	Collected: 05/21/19 10:45	Received: 05/21/19 16:00	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	4.63 ± 4.02	(7.23)	pCi/L	05/30/19 19:55	12587-46-1	
		C:NA	T:NA				
Gross Beta	EPA 900.0	9.08 ± 2.92	(3.78)	pCi/L	05/30/19 19:55	12587-47-2	
		C:NA	T:NA				

Sample: 603286		Lab ID: 10475854002	Collected: 05/21/19 12:50	Received: 05/21/19 16:00	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	6.25 ± 4.24	(6.92)	pCi/L	05/30/19 19:55	12587-46-1	
		C:NA	T:NA				
Gross Beta	EPA 900.0	4.64 ± 3.44	(6.07)	pCi/L	05/30/19 19:55	12587-47-2	
		C:NA	T:NA				

Sample: 603284		Lab ID: 10475854003	Collected: 05/21/19 14:20	Received: 05/21/19 16:00	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	1.35 ± 5.45	(11.2)	pCi/L	05/30/19 19:55	12587-46-1	
		C:NA	T:NA				
Gross Beta	EPA 900.0	9.38 ± 5.49	(9.43)	pCi/L	05/30/19 19:55	12587-47-2	
		C:NA	T:NA				

Sample: 603283		Lab ID: 10475854004	Collected: 05/21/19 15:40	Received: 05/21/19 16:00	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	42.8 ± 16.8	(20.6)	pCi/L	05/30/19 19:56	12587-46-1	
		C:NA	T:NA				
Gross Beta	EPA 900.0	32.6 ± 12.4	(17.0)	pCi/L	05/30/19 19:56	12587-47-2	
		C:NA	T:NA				

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

QC Batch: 344343

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

METHOD BLANK: 1675864

Matrix: Water

Associated Lab Samples: 10475854001, 10475854002, 10475854003, 10475854004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.427 ± 1.11 (2.64) C:NA T:NA	pCi/L	05/30/19 19:55	
Gross Beta	2.21 ± 1.79 (3.27) C:NA T:NA	pCi/L	05/30/19 19:55	

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10475854

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis
PASI-PA Pace Analytical Services - Greensburg
PASI-V Pace Analytical Services - Virginia

BATCH QUALIFIERS

Batch: 608183

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
S0 Surrogate recovery outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10475854001	472759	EPA Mod. 3510C	607602	EPA 8082A	608183
10475854002	603286	EPA Mod. 3510C	607602	EPA 8082A	608183
10475854003	603284	EPA Mod. 3510C	607602	EPA 8082A	608183
10475854004	603283	EPA Mod. 3510C	607602	EPA 8082A	608183
10475854001	472759	EPA 200.7	608670	EPA 200.7	608907
10475854002	603286	EPA 200.7	609218	EPA 200.7	610218
10475854003	603284	EPA 200.7	609218	EPA 200.7	610218
10475854004	603283	EPA 200.7	609218	EPA 200.7	610218
10475854001	472759	EPA 200.8	609219	EPA 200.8	610407
10475854002	603286	EPA 200.8	609219	EPA 200.8	610407
10475854003	603284	EPA 200.8	609219	EPA 200.8	610407
10475854004	603283	EPA 200.8	609219	EPA 200.8	610407
10475854001	472759	EPA 3520	607604	EPA 8270D	609407
10475854002	603286	EPA 3520	607604	EPA 8270D	609407
10475854003	603284	EPA 3520	607604	EPA 8270D	609407
10475854004	603283	EPA 3520	607604	EPA 8270D	609407
10475854001	472759				
10475854002	603286				
10475854003	603284				
10475854004	603283				
10475854001	472759	EPA 900.0	344343		
10475854002	603286	EPA 900.0	344343		
10475854003	603284	EPA 900.0	344343		
10475854004	603283	EPA 900.0	344343		
10475854001	472759	EPA 300.0	607680		
10475854002	603286	EPA 300.0	607680		
10475854003	603284	EPA 300.0	607680		
10475854004	603283	EPA 300.0	607680		
10475854001	472759	SM 3500-Cr B Modified	607489		
10475854002	603286	SM 3500-Cr B Modified	607489		
10475854003	603284	SM 3500-Cr B Modified	607489		
10475854004	603283	SM 3500-Cr B Modified	607489		
10475854001	472759	EPA 350.1			
10475854002	603286	EPA 350.1			
10475854003	603284	EPA 350.1			
10475854004	603283	EPA 350.1			
10475854001	472759	EPA 350.1 rev. 2 (1993)	166887	EPA 350.1 rev. 2 (1993)	167036
10475854002	603286	EPA 350.1 rev. 2 (1993)	166887	EPA 350.1 rev. 2 (1993)	167036
10475854003	603284	EPA 350.1 rev. 2 (1993)	166887	EPA 350.1 rev. 2 (1993)	167036
10475854004	603283	EPA 350.1 rev. 2 (1993)	166887	EPA 350.1 rev. 2 (1993)	167036
10475854001	472759	SM 4500-CN-E	610208	SM 4500-CN-E	610283
10475854002	603286	SM 4500-CN-E	610208	SM 4500-CN-E	610283
10475854003	603284	SM 4500-CN-E	610208	SM 4500-CN-E	610283

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10475854

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10475854004	603283	SM 4500-CN-E	610208	SM 4500-CN-E	610283

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

NO# 10475854



10475854

Study Form revision 2013.0509

Work Order Number:

COC Type:

Page: / of /

Turnaround Time:

COC ID:

Minnesota Pollution Control Agency	PROJECT/CLIENT INFO		LABORATORY		FOR LAB USE ONLY
Facility Code: MNSW-057	Program Code (MDH Lab Only):		Lab Name: Pace Analytical - Minneapolis, MN		
Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters	Project Task Code: PRJ07786	Address: 1700 SE Elm Street			
Project Manager: Brad Jacobson	612-607-6375	EPIC PROFILE #: 38716 Line 2		Minneapolis MN 55414	
Potential Hazard?	If yes, add information to Sampler Comments Section			Phone No: 612-607-6400	

Lab Work Order Sticker

SAMPLE DETAILS											ANALYSIS REQUESTED							Lab Sample No.	#	
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/ Unionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a			8270 SVOC, 8082, MDA1, MDA2 - QAPP Table 3a
472759	sample	5/21/19	1045			G	NW	WTR-GROUND	N	(OFMW-1)	14		X	X	X	X	X	X		1
603286	sample	5/21/19	1050			G	NW	WTR-GROUND	N	(MW-97-9)	14		X	X	X	X	X	X		2
603284	sample	5/21/19	1420			G	NW	WTR-GROUND	N	(MW-97-7)	14		X	X	X	X	X	X		3
603283	sample	5/21/19	1540			G	NW	WTR-GROUND	N	(MW-97-3)	14		X	X	X	X	X	X		4
									N											5
									N											6
									N											7
									N											8
									N											9
									N											10

W1
W2
W3
W4

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) <u>David Anderson / Pace Analytical</u>	<u>5/21/19/1600</u>	<u>(HATA) Pace T=5.3, 5.9, 5.6, 5.2°C</u>	<u>5-21-19, 3:00</u>

FE 5/21/19
15°C

Sample Condition Upon Receipt

Client Name: MPCA Project #: _____

WO# : 10475854
 PM: JMA Due Date: 06/05/19
 CLIENT: PAST-MNFLED

Courier: Fed Ex UPS USPS Client
 Pace SpeeDee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer: T1(0461) T2(1336) T3(0459)
 T4(0254) T5(0489) Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank <u>5.2, 5.9, 5.6, 5.2</u> °C	Average Corrected Temp See Exceptions (no temp blank only): <input type="checkbox"/>
Correction Factor: <u>None</u>	Cooler Temp Corrected w/temp blank <u>5.2, 5.9, 5.6, 5.2</u> °C	°C

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: JMA 5/22/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <small>JMA 5/22/19</small>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: See Exception <input type="checkbox"/>
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. Chlorine? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No See Exception <input type="checkbox"/> pH Paper Lot#
		Res. Chlorine 0-6 Roll 0-6 Strip 0-14 Strip <u>9016</u> <u>203619</u> <u>10D2921</u>
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased):

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No

Comments/Resolution: _____

Project Manager Review: J. Anderson Date: 05/22/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: FE



Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No

Owner Received Date: 5/21/2019 Results Requested By: 6/12/2019

Workorder: 10475854 Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Report To		Subcontract To		Requested Analysis																				
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																						
				350.1 Ammonia Unionized Ammonia																				
				Preserved Containers																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4 BP35																	LAB USE ONLY	
1	472759	PS	5/21/2019 10:45	10475854001	Water	1									X	X								
2	603286	PS	5/21/2019 12:50	10475854002	Water	1									X	X								
3	603284	PS	5/21/2019 14:20	10475854003	Water	1									X	X								
4	603283	PS	5/21/2019 15:40	10475854004	Water	1									X	X								
5																								

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	5/21/19 18:15	<i>[Signature]</i>	5/22/19 18:15						
<i>[Signature]</i>	5/22/19 23:30	<i>[Signature]</i>	5/23/19 06:45						

Cooler Temperature on Receipt °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Sample Condition Upon Receipt

Client Name:

Project #:

WO#: 12125365

PM: CLJ

Due Date: 06/13/19

CLIENT: PACE MPLS

Courier: [] Fed Ex [] UPS [] USPS [] Client [] Commercial [x] Pace [] Other:

Tracking Number:

Custody Seal on Cooler/Box Present? [x] Yes [] No Seals Intact? [x] Yes [] No Optional: Proj. Due Date: Proj. Name:

Packing Material: [x] Bubble Wrap [x] Bubble Bags [] None [] Other: Temp Blank? [x] Yes [] No

Thermometer Used: [x] 140792808 Type of Ice: [] Wet [] Blue [] None [x] Samples on ice, cooling process has begun

Cooler Temp Read °C: -0.2 Cooler Temp Corrected °C: 0.1 Biological Tissue Frozen? [] Yes [] No [x] NA

Temp should be above freezing to 6 °C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 5/22/19 OC

Table with 16 rows of inspection items and checkboxes. Includes 'Chain of Custody Present?', 'Samples Arrived within Hold Time?', 'Short Hold Time Analysis (<72 hr)?', 'Rush Turn Around Time Requested?', 'Sufficient Volume?', 'Correct Containers Used?', 'Containers Intact?', 'Filtered Volume Received for Dissolved Tests?', 'Sample Labels Match COC?', 'All containers needing acid/base preservation properly preserved?', 'Headspace in Methyl Mercury Container', 'Headspace in VOA Vials (>6mm)?', 'Trip Blank Present?', 'Trip Blank Custody Seals Present?'. Includes handwritten 'WT' and 'BM 5/23/19'.

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? [] Yes [] No

Person Contacted: Date/Time:

Comments/Resolution:

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Nikki Jarve

Date: 5/23/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace - MN

Project## 30295937

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4638 0196 7204

Label	<u>DK</u>
LIMS Login	<u>DK</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DK 05-23-19</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>PH-2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DK</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DK</u> Date: <u>05-23-19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

May 31, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 05/23/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2020
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2020
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
472759	A192110-01	Water	05/21/2019	05/23/2019
603286	A192110-02	Water	05/21/2019	05/23/2019
603284	A192110-03	Water	05/21/2019	05/23/2019
603283	A192110-04	Water	05/21/2019	05/23/2019

CASE NARRATIVE

Sample Receipt Information:

4 samples were received on 05/23/2019. Samples were received at 1.2 degrees Celsius. Samples were received in acceptable condition, with the exception of one broken container.

One amber liter bottle for sample A192110-03 was received broken. Lab was able to proceed with the analyses using the remaining sample volume.

Please see the chain of custody (COC) document at the end of this report for additional information.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

472759

Date Sampled

A192110-01 (Water)

05/21/2019 10:45

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905267

Acetochlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
EPTC	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Phorate	ND	0.30	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Prometon	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Propazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Simazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Triallate	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:11	EPA 8270D	
Surrogate: Atrazine-d5		85.6 %		56.9-123	05/28/2019	05/29/2019 15:11	EPA 8270D	
Surrogate: Parathion-d10		90.9 %		23.8-169	05/28/2019	05/29/2019 15:11	EPA 8270D	
Surrogate: Triphenyl phosphate		95.2 %		50.5-178	05/28/2019	05/29/2019 15:11	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905268

2,4-D	ND	0.50	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
Dicamba	ND	0.50	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
MCPA	ND	0.30	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
Picloram	ND	0.50	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	05/28/2019	05/29/2019 18:55	EPA 8151A	
Surrogate: 2,4-D-d5		57.2 %		43.1-133	05/28/2019	05/29/2019 18:55	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

603286

A192110-02 (Water)

Date Sampled

05/21/2019 12:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905267

Acetochlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Alachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Atrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Chlorpyrifos	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Cyanazine	ND	0.20	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Desethylatrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Deisopropylatrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Dimethenamid	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
EPTC	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Ethalfuralin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Fonofos	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Metolachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Metribuzin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Pendimethalin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Phorate	ND	0.30	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Prometon	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Propachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Propazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Simazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Terbufos	ND	0.20	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Triallate	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Trifluralin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 15:40	EPA 8270D
Surrogate: Atrazine-d5		90.1 %		56.9-123	05/28/2019	05/29/2019 15:40	EPA 8270D
Surrogate: Parathion-d10		89.4 %		23.8-169	05/28/2019	05/29/2019 15:40	EPA 8270D
Surrogate: Triphenyl phosphate		95.6 %		50.5-178	05/28/2019	05/29/2019 15:40	EPA 8270D

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905268

2,4-D	ND	0.50	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
2,4-DB	ND	0.50	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
2,4,5-T	ND	0.50	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
Bentazon	ND	0.50	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
Dicamba	ND	0.50	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
MCPA	ND	0.30	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
Picloram	ND	0.50	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
Triclopyr	ND	0.50	ug/L	1	05/28/2019	05/29/2019 19:31	EPA 8151A
Surrogate: 2,4-D-d5		75.7 %		43.1-133	05/28/2019	05/29/2019 19:31	EPA 8151A

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

603284

A192110-03 (Water)

Date Sampled

05/21/2019 14:20

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905267

Acetochlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Alachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Atrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Chlorpyrifos	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Cyanazine	ND	0.20	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Desethylatrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Deisopropylatrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Dimethenamid	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
EPTC	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Ethalfuralin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Fonofos	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Metolachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Metribuzin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Pendimethalin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Phorate	ND	0.30	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Prometon	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Propachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Propazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Simazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Terbufos	ND	0.20	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Triallate	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Trifluralin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:08	EPA 8270D
Surrogate: Atrazine-d5		82.5 %	56.9-123		05/28/2019	05/29/2019 16:08	EPA 8270D
Surrogate: Parathion-d10		103 %	23.8-169		05/28/2019	05/29/2019 16:08	EPA 8270D
Surrogate: Triphenyl phosphate		93.5 %	50.5-178		05/28/2019	05/29/2019 16:08	EPA 8270D

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905268

2,4-D	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
2,4-DB	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
2,4,5-T	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
Bentazon	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
Dicamba	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
MCPA	ND	0.30	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
Picloram	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
Triclopyr	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:06	EPA 8151A
Surrogate: 2,4-D-d5		80.9 %	43.1-133		05/28/2019	05/29/2019 20:06	EPA 8151A

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

603283

A192110-04 (Water)

Date Sampled

05/21/2019 15:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905267

Acetochlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Alachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Atrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Chlorpyrifos	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Cyanazine	ND	0.20	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Desethylatrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Deisopropylatrazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Dimethenamid	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
EPTC	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Ethalfuralin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Fonofos	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Metolachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Metribuzin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Pendimethalin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Phorate	ND	0.30	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Prometon	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Propachlor	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Propazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Simazine	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Terbufos	ND	0.20	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Triallate	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Trifluralin	ND	0.50	ug/L	1	05/28/2019	05/29/2019 16:37	EPA 8270D
Surrogate: Atrazine-d5		87.0 %	56.9-123		05/28/2019	05/29/2019 16:37	EPA 8270D
Surrogate: Parathion-d10		88.0 %	23.8-169		05/28/2019	05/29/2019 16:37	EPA 8270D
Surrogate: Triphenyl phosphate		97.0 %	50.5-178		05/28/2019	05/29/2019 16:37	EPA 8270D

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905268

2,4-D	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
2,4-DB	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
2,4,5-T	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
Bentazon	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
Dicamba	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
MCPA	ND	0.30	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
Picloram	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
Triclopyr	ND	0.50	ug/L	1	05/28/2019	05/29/2019 20:41	EPA 8151A
Surrogate: 2,4-D-d5		68.9 %	43.1-133		05/28/2019	05/29/2019 20:41	EPA 8151A

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A905267 - EPA 3510C

Blank (A905267-BLK1)

Prepared: 05/28/2019 Analyzed: 05/29/2019 13:46

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							

Surrogate: Atrazine-d5 0.404 ug/L 0.5250 76.9 56.9-123

Surrogate: Parathion-d10 0.483 ug/L 0.5445 88.7 23.8-169

Surrogate: Triphenyl phosphate 0.432 ug/L 0.5000 86.4 50.5-178

LCS (A905267-BS1)

Prepared: 05/28/2019 Analyzed: 05/29/2019 14:15

Acetochlor	0.895	0.50	ug/L	1.000		89.5	67.8-122
Alachlor	0.897	0.50	ug/L	1.000		89.7	68.6-119
Atrazine	0.916	0.50	ug/L	1.000		91.6	68.6-115
Chlorpyrifos	0.835	0.50	ug/L	1.000		83.5	63.1-120
Cyanazine	0.961	0.20	ug/L	1.000		96.1	55.3-143
Desethylatrazine	0.849	0.50	ug/L	1.000		84.9	67.8-115
Deisopropylatrazine	0.729	0.50	ug/L	1.000		72.9	50.1-100
Dimethenamid	0.919	0.50	ug/L	1.000		91.9	70.3-121
EPTC	0.708	0.50	ug/L	1.000		70.8	50.4-101
Ethalfuralin	0.747	0.50	ug/L	1.000		74.7	42.6-121
Fonofos	1.01	0.50	ug/L	1.000		101	56.6-119
Metolachlor	0.938	0.50	ug/L	1.000		93.8	71.3-128
Metribuzin	0.890	0.50	ug/L	1.000		89.0	64.9-120
Pendimethalin	0.836	0.50	ug/L	1.000		83.6	60.9-128
Phorate	0.662	0.30	ug/L	1.000		66.2	37.3-112
Prometon	0.908	0.50	ug/L	1.000		90.8	67.1-120
Propachlor	1.13	0.50	ug/L	1.000		113	66.2-127
Propazine	0.956	0.50	ug/L	1.000		95.6	68.2-118
Simazine	0.946	0.50	ug/L	1.000		94.6	67.2-117

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A905267 - EPA 3510C

LCS (A905267-BS1)

Prepared: 05/28/2019 Analyzed: 05/29/2019 14:15

Terbufos	0.557	0.20	ug/L	1.000		55.7	34.3-111			
Triallate	0.858	0.50	ug/L	1.000		85.8	53-121			
Trifluralin	0.620	0.50	ug/L	1.000		62.0	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.450</i>		<i>ug/L</i>	<i>0.5250</i>		<i>85.7</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.569</i>		<i>ug/L</i>	<i>0.5445</i>		<i>105</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.468</i>		<i>ug/L</i>	<i>0.5000</i>		<i>93.6</i>	<i>50.5-178</i>			

LCS Dup (A905267-BS1)

Prepared: 05/28/2019 Analyzed: 05/29/2019 14:43

Acetochlor	0.938	0.50	ug/L	1.000		93.8	67.8-122	4.69	20	
Alachlor	0.933	0.50	ug/L	1.000		93.3	68.6-119	4.01	20	
Atrazine	0.990	0.50	ug/L	1.000		99.0	68.6-115	7.83	20	
Chlorpyrifos	0.848	0.50	ug/L	1.000		84.8	63.1-120	1.66	20	
Cyanazine	1.02	0.20	ug/L	1.000		102	55.3-143	5.72	20	
Desethylatrazine	0.874	0.50	ug/L	1.000		87.4	67.8-115	2.90	20	
Deisopropylatrazine	0.698	0.50	ug/L	1.000		69.8	50.1-100	4.32	20	
Dimethenamid	0.970	0.50	ug/L	1.000		97.0	70.3-121	5.33	20	
EPTC	0.687	0.50	ug/L	1.000		68.7	50.4-101	2.92	20	
Ethalfuralin	0.700	0.50	ug/L	1.000		70.0	42.6-121	6.54	20	
Fonofos	0.966	0.50	ug/L	1.000		96.6	56.6-119	4.13	20	
Metolachlor	0.998	0.50	ug/L	1.000		99.8	71.3-128	6.21	20	
Metribuzin	0.949	0.50	ug/L	1.000		94.9	64.9-120	6.37	20	
Pendimethalin	0.902	0.50	ug/L	1.000		90.2	60.9-128	7.62	20	
Phorate	0.647	0.30	ug/L	1.000		64.7	37.3-112	2.35	20	
Prometon	0.980	0.50	ug/L	1.000		98.0	67.1-120	7.72	20	
Propachlor	1.04	0.50	ug/L	1.000		104	66.2-127	8.63	20	
Propazine	1.02	0.50	ug/L	1.000		102	68.2-118	6.81	20	
Simazine	0.998	0.50	ug/L	1.000		99.8	67.2-117	5.32	20	
Terbufos	0.561	0.20	ug/L	1.000		56.1	34.3-111	0.832	20	
Triallate	0.843	0.50	ug/L	1.000		84.3	53-121	1.82	20	
Trifluralin	0.653	0.50	ug/L	1.000		65.3	45.9-116	5.26	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.487</i>		<i>ug/L</i>	<i>0.5250</i>		<i>92.8</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.534</i>		<i>ug/L</i>	<i>0.5445</i>		<i>98.0</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.491</i>		<i>ug/L</i>	<i>0.5000</i>		<i>98.2</i>	<i>50.5-178</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A905268 - EPA 3510C

Blank (A905268-BLK1)

Prepared: 05/28/2019 Analyzed: 05/29/2019 18:20

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
Surrogate: 2,4-D-d5	1.69		ug/L	2.006		84.3	43.1-133			

LCS (A905268-BS1)

Prepared: 05/28/2019 Analyzed: 05/29/2019 16:34

2,4-D	1.71	0.50	ug/L	2.000		85.4	51.7-152			
2,4-DB	1.58	0.50	ug/L	2.000		79.1	51.5-146			
2,4,5-T	1.79	0.50	ug/L	2.000		89.4	55.4-138			
2,4,5-TP (Silvex)	1.62	0.50	ug/L	2.000		81.2	47.2-152			
Bentazon	0.874	0.50	ug/L	1.000		87.4	48.9-146			
Dicamba	1.37	0.50	ug/L	2.000		68.6	41-149			
MCPA	1.52	0.30	ug/L	2.000		76.2	32.6-148			
Picloram	0.659	0.50	ug/L	1.000		65.9	37.8-121			
Triclopyr	1.60	0.50	ug/L	2.000		80.0	49.9-149			
Surrogate: 2,4-D-d5	1.47		ug/L	2.006		73.5	43.1-133			

LCS Dup (A905268-BS1)

Prepared: 05/28/2019 Analyzed: 05/29/2019 17:10

2,4-D	1.60	0.50	ug/L	2.000		80.2	51.7-152	6.25	20	
2,4-DB	1.69	0.50	ug/L	2.000		84.5	51.5-146	6.55	20	
2,4,5-T	1.90	0.50	ug/L	2.000		94.8	55.4-138	5.87	20	
2,4,5-TP (Silvex)	1.70	0.50	ug/L	2.000		84.8	47.2-152	4.31	20	
Bentazon	0.898	0.50	ug/L	1.000		89.8	48.9-146	2.71	20	
Dicamba	1.56	0.50	ug/L	2.000		77.9	41-149	12.7	20	
MCPA	1.52	0.30	ug/L	2.000		76.1	32.6-148	0.151	20	
Picloram	0.742	0.50	ug/L	1.000		74.2	37.8-121	11.9	20	
Triclopyr	1.69	0.50	ug/L	2.000		84.3	49.9-149	5.27	20	
Surrogate: 2,4-D-d5	1.50		ug/L	2.006		75.0	43.1-133			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10475854
Project Manager: Jennifer Anderson

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference



31-May-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10475854**

Work Order: **19051578**

Dear Jennifer,

ALS Environmental received 4 samples on 23-May-2019 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 10.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10475854
Work Order: 19051578

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
19051578-01	472759	Water		5/21/2019 10:45	5/23/2019 09:30	<input type="checkbox"/>
19051578-02	603286	Water		5/21/2019 12:50	5/23/2019 09:30	<input type="checkbox"/>
19051578-03	603284	Water		5/21/2019 14:20	5/23/2019 09:30	<input type="checkbox"/>
19051578-04	603283	Water		5/21/2019 15:40	5/23/2019 09:30	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10475854
WorkOrder: 19051578

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 31-May-19

Client: Pace Analytical Services, LLC

Project: 10475854

Work Order: 19051578

Sample ID: 472759

Lab ID: 19051578-01

Collection Date: 5/21/2019 10:45 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	5/31/2019 02:42 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 31-May-19

Client: Pace Analytical Services, LLC**Project:** 10475854**Work Order:** 19051578**Sample ID:** 603286**Lab ID:** 19051578-02**Collection Date:** 5/21/2019 12:50 PM**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	5/31/2019 02:42 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 31-May-19

Client: Pace Analytical Services, LLC

Project: 10475854

Work Order: 19051578

Sample ID: 603284

Lab ID: 19051578-03

Collection Date: 5/21/2019 02:20 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	5/31/2019 02:42 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 31-May-19

Client: Pace Analytical Services, LLC

Project: 10475854

Work Order: 19051578

Sample ID: 603283

Lab ID: 19051578-04

Collection Date: 5/21/2019 03:40 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	5/31/2019 02:42 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 19051578
Project: 10475854

QC BATCH REPORT

Batch ID: **R261706** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R261706-R261706				Units: µg/L		Analysis Date: 5/31/2019 02:42 PM		
Client ID:		Run ID: WETCHEM_190531V		SeqNo: 5689080		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free ND 20

LCS		Sample ID: LCS-R261706-R261706				Units: µg/L		Analysis Date: 5/31/2019 02:42 PM		
Client ID:		Run ID: WETCHEM_190531V		SeqNo: 5689081		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 274.4 20 250 0 110 81-119 0

MS		Sample ID: 19051781-01A MS				Units: µg/L		Analysis Date: 5/31/2019 02:42 PM		
Client ID:		Run ID: WETCHEM_190531V		SeqNo: 5689087		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 235.5 20 250 -6.08 96.6 81-119 0

MSD		Sample ID: 19051781-01A MSD				Units: µg/L		Analysis Date: 5/31/2019 02:42 PM		
Client ID:		Run ID: WETCHEM_190531V		SeqNo: 5689088		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 239.6 20 250 -6.08 98.3 81-119 235.5 1.71 20

The following samples were analyzed in this batch:

19051578-01A	19051578-02A	19051578-03A
19051578-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **23-May-19 09:30**

Work Order: **19051578**

Received by: **DS**

Checklist completed by Diane Shaw 23-May-19
eSignature Date

Reviewed by: Chad Whilton 23-May-19
eSignature Date

Matrices: Water

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No
- Sample(s) received on ice? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

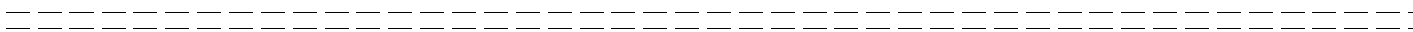
Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:



Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

June 07, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476012

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on May 22, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137

Minnesota Petrofund Certification #: 1240

Mississippi Certification #: MN00064

Missouri Certification #: 10100

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Primary Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Vermont Certification #: VT-027053137

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DEP Certification #: 382

West Virginia DW Certification #: 9952 C

Wisconsin Certification #: 999407970

Wyoming UST Certification #: via A2LA 2926.01

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10476012001	813763	Water	05/22/19 12:00	05/22/19 13:48

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10476012001	813763	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	BWB, PW1	12	PASI-M
		EPA 8270D	STB	38	PASI-M
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	KEO	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

Sample: 813763	Lab ID: 10476012001	Collected: 05/22/19 12:00	Received: 05/22/19 13:48	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	1.0	1	05/22/19 17:24	05/24/19 11:33	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	76	%	30-125	1	05/22/19 17:24	05/24/19 11:33	877-09-8	
Decachlorobiphenyl (S)	64	%	30-125	1	05/22/19 17:24	05/24/19 11:33	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	05/28/19 15:31	05/29/19 09:33	7429-90-5	
Barium, Dissolved	19.0	ug/L	10.0	1	05/28/19 15:31	05/29/19 09:33	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	05/28/19 15:31	05/29/19 09:33	7440-50-8	
Manganese, Dissolved	ND	ug/L	5.0	1	05/28/19 15:31	05/29/19 09:33	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	05/28/19 15:31	05/29/19 09:33	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	05/28/19 15:31	05/29/19 09:33	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	05/28/19 15:31	05/29/19 09:33	7440-31-5	
Total Hardness by 2340B, Dissolved	277000	ug/L	3300	1	05/28/19 15:31	05/29/19 09:33		
Zinc, Dissolved	59.2	ug/L	20.0	1	05/28/19 15:31	05/29/19 09:33	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	13.9	ug/L	10.0	20	06/03/19 10:23	06/05/19 09:50	7440-36-0	
Arsenic, Dissolved	ND	ug/L	10.0	20	06/03/19 10:23	06/05/19 09:50	7440-38-2	
Beryllium, Dissolved	ND	ug/L	4.0	20	06/03/19 10:23	06/05/19 09:50	7440-41-7	
Boron, Dissolved	12800	ug/L	2500	250	06/03/19 10:23	06/06/19 15:47	7440-42-8	
Cadmium, Dissolved	ND	ug/L	1.6	20	06/03/19 10:23	06/05/19 09:50	7440-43-9	
Chromium, Dissolved	88.9	ug/L	10.0	20	06/03/19 10:23	06/05/19 09:50	7440-47-3	
Cobalt, Dissolved	308	ug/L	10.0	20	06/03/19 10:23	06/05/19 09:50	7440-48-4	
Lead, Dissolved	ND	ug/L	2.0	20	06/03/19 10:23	06/05/19 09:50	7439-92-1	
Selenium, Dissolved	ND	ug/L	10.0	20	06/03/19 10:23	06/05/19 09:50	7782-49-2	
Thallium, Dissolved	ND	ug/L	2.0	20	06/03/19 10:23	06/05/19 09:50	7440-28-0	
Uranium, Dissolved	ND	ug/L	10.0	20	06/03/19 10:23	06/05/19 09:50	7440-61-1	
Vanadium, Dissolved	20.1	ug/L	20.0	20	06/03/19 10:23	06/05/19 09:50	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	83-32-9	
Anthracene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	120-12-7	
Benzo(a)pyrene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	50-32-8	
Benzoic acid	10400	ug/L	10000	20	05/22/19 19:09	06/04/19 13:37	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	101-55-3	
Butylbenzylphthalate	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

Sample: 813763	Lab ID: 10476012001	Collected: 05/22/19 12:00	Received: 05/22/19 13:48	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
2-Chlorophenol	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	10000	20	05/22/19 19:09	06/04/19 13:37	91-94-1	
2,4-Dichlorophenol	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	120-83-2	
Diethylphthalate	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	84-66-2	
2,4-Dimethylphenol	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	105-67-9	
Dimethylphthalate	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	131-11-3	
Di-n-butylphthalate	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	84-74-2	
2,4-Dinitrophenol	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	51-28-5	
Di-n-octylphthalate	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	117-81-7	
Fluoranthene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	206-44-0	
Fluorene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	86-73-7	
Hexachlorobenzene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	10000	20	05/22/19 19:09	06/04/19 13:37	77-47-4	
Hexachloroethane	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	67-72-1	
Isophorone	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	78-59-1	
2-Methylnaphthalene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	95-48-7	
3&4-Methylphenol(m&p Cresol)	7670	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37		
N-Nitrosodimethylamine	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	62-75-9	
Pentachlorophenol	ND	ug/L	4000	20	05/22/19 19:09	06/04/19 13:37	87-86-5	
Phenanthrene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	85-01-8	
Phenol	2330	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	108-95-2	
Pyrene	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	2000	20	05/22/19 19:09	06/04/19 13:37	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	0	%	55-125	20	05/22/19 19:09	06/04/19 13:37	4165-60-0	D3,S4
2-Fluorobiphenyl (S)	0	%	52-125	20	05/22/19 19:09	06/04/19 13:37	321-60-8	S4
p-Terphenyl-d14 (S)	0	%	57-125	20	05/22/19 19:09	06/04/19 13:37	1718-51-0	S4
Phenol-d6 (S)	0	%	30-125	20	05/22/19 19:09	06/04/19 13:37	13127-88-3	S4
2-Fluorophenol (S)	0	%	30-125	20	05/22/19 19:09	06/04/19 13:37	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	52-125	20	05/22/19 19:09	06/04/19 13:37	118-79-6	S4
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	2440	mg/L	60.0	50		05/24/19 10:17	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	0.28	mg/L	0.10	10		05/22/19 18:28		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

QC Batch: 608670 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
 Associated Lab Samples: 10476012001

METHOD BLANK: 3290018 Matrix: Water

Associated Lab Samples: 10476012001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	05/29/19 09:23	
Barium, Dissolved	ug/L	ND	10.0	05/29/19 09:23	
Copper, Dissolved	ug/L	ND	10.0	05/29/19 09:23	
Manganese, Dissolved	ug/L	ND	5.0	05/29/19 09:23	
Nickel, Dissolved	ug/L	ND	20.0	05/29/19 09:23	
Silver, Dissolved	ug/L	ND	10.0	05/29/19 09:23	
Tin, Dissolved	ug/L	ND	75.0	05/29/19 09:23	
Zinc, Dissolved	ug/L	ND	20.0	05/29/19 09:23	

LABORATORY CONTROL SAMPLE: 3290019

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21700	108	85-115	
Barium, Dissolved	ug/L	1000	1030	103	85-115	
Copper, Dissolved	ug/L	1000	997	100	85-115	
Manganese, Dissolved	ug/L	1000	1040	104	85-115	
Nickel, Dissolved	ug/L	1000	1010	101	85-115	
Silver, Dissolved	ug/L	500	509	102	85-115	
Tin, Dissolved	ug/L	1000	998	100	85-115	
Zinc, Dissolved	ug/L	1000	1030	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3290020 3290021

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10476012001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21500	22000	107	110	70-130	2	20
Barium, Dissolved	ug/L	19.0	1000	1000	1030	1050	101	103	70-130	2	20
Copper, Dissolved	ug/L	ND	1000	1000	1010	1020	100	102	70-130	2	20
Manganese, Dissolved	ug/L	ND	1000	1000	1020	1040	102	104	70-130	2	20
Nickel, Dissolved	ug/L	ND	1000	1000	981	994	98	99	70-130	1	20
Silver, Dissolved	ug/L	ND	500	500	512	521	102	104	70-130	2	20
Tin, Dissolved	ug/L	ND	1000	1000	979	999	98	100	70-130	2	20
Zinc, Dissolved	ug/L	59.2	1000	1000	1050	1070	99	101	70-130	2	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476012

QC Batch: 609219 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10476012001

METHOD BLANK: 3292568 Matrix: Water
Associated Lab Samples: 10476012001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Arsenic, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Beryllium, Dissolved	ug/L	ND	0.20	06/05/19 09:44	
Boron, Dissolved	ug/L	ND	10.0	06/05/19 09:44	
Cadmium, Dissolved	ug/L	ND	0.080	06/05/19 09:44	
Chromium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Cobalt, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Lead, Dissolved	ug/L	ND	0.10	06/05/19 09:44	
Selenium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Thallium, Dissolved	ug/L	ND	0.10	06/05/19 09:44	
Uranium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Vanadium, Dissolved	ug/L	ND	1.0	06/05/19 09:44	

LABORATORY CONTROL SAMPLE: 3292569

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	106	106	85-115	
Arsenic, Dissolved	ug/L	100	101	101	85-115	
Beryllium, Dissolved	ug/L	100	94.2	94	85-115	
Boron, Dissolved	ug/L	100	99.9	100	85-115	
Cadmium, Dissolved	ug/L	100	101	101	85-115	
Chromium, Dissolved	ug/L	100	102	102	85-115	
Cobalt, Dissolved	ug/L	100	104	104	85-115	
Lead, Dissolved	ug/L	100	104	104	85-115	
Selenium, Dissolved	ug/L	100	112	112	85-115	
Thallium, Dissolved	ug/L	100	111	111	85-115	
Uranium, Dissolved	ug/L	100	98.2	98	85-115	
Vanadium, Dissolved	ug/L	100	99.8	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292570 3292571

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10476128001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony, Dissolved	ug/L	ND	100	100	108	108	107	108	70-130	1	20	
Arsenic, Dissolved	ug/L	ND	100	100	102	102	101	102	70-130	1	20	
Beryllium, Dissolved	ug/L	ND	100	100	96.3	96.0	96	96	70-130	0	20	
Boron, Dissolved	ug/L	77.5	100	100	167	168	89	90	70-130	1	20	
Cadmium, Dissolved	ug/L	0.13	100	100	95.8	97.8	96	98	70-130	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292570												3292571	
Parameter	Units	10476128001		MS	MSD	MS	MSD	MS	MSD	% Rec	Max		
		Result	Conc.	Spike	Spike	Result	Result	% Rec	% Rec	Limits	RPD		
Chromium, Dissolved	ug/L	ND	100	100	108	109	108	109	70-130	1	20		
Cobalt, Dissolved	ug/L	ND	100	100	104	105	104	105	70-130	1	20		
Lead, Dissolved	ug/L	0.11	100	100	95.6	96.7	96	97	70-130	1	20		
Selenium, Dissolved	ug/L	2.7	100	100	114	116	111	113	70-130	2	20		
Thallium, Dissolved	ug/L	0.11	100	100	103	104	103	104	70-130	1	20		
Uranium, Dissolved	ug/L	11.5	100	100	111	110	99	98	70-130	1	20		
Vanadium, Dissolved	ug/L	ND	100	100	111	113	110	112	70-130	1	20		

MATRIX SPIKE SAMPLE: 3292572									
Parameter	Units	10476128003	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Antimony, Dissolved	ug/L	ND	100	105	105	70-130			
Arsenic, Dissolved	ug/L	ND	100	101	101	70-130			
Beryllium, Dissolved	ug/L	ND	100	97.9	98	70-130			
Boron, Dissolved	ug/L	13.2	100	116	103	70-130			
Cadmium, Dissolved	ug/L	ND	100	99.9	100	70-130			
Chromium, Dissolved	ug/L	ND	100	104	104	70-130			
Cobalt, Dissolved	ug/L	ND	100	105	105	70-130			
Lead, Dissolved	ug/L	ND	100	102	102	70-130			
Selenium, Dissolved	ug/L	ND	100	110	110	70-130			
Thallium, Dissolved	ug/L	ND	100	108	108	70-130			
Uranium, Dissolved	ug/L	ND	100	98.1	98	70-130			
Vanadium, Dissolved	ug/L	ND	100	103	103	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

QC Batch: 607602

Analysis Method: EPA 8082A

QC Batch Method: EPA Mod. 3510C

Analysis Description: 8082A GCS PCB

Associated Lab Samples: 10476012001

METHOD BLANK: 3284566

Matrix: Water

Associated Lab Samples: 10476012001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	05/24/19 09:32	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	05/24/19 09:32	
Decachlorobiphenyl (S)	%	117	30-125	05/24/19 09:32	
Tetrachloro-m-xylene (S)	%	53	30-125	05/24/19 09:32	

LABORATORY CONTROL SAMPLE & LCSD: 3284567

3284568

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	1.6	1.6	81	82	45-125	1	20	
PCB-1260 (Aroclor 1260)	ug/L	2	1.8	1.8	90	91	49-125	0	20	
Decachlorobiphenyl (S)	%				126	125	30-125			S0
Tetrachloro-m-xylene (S)	%				72	75	30-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476012

QC Batch: 607604 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10476012001

METHOD BLANK: 3284579 Matrix: Water
Associated Lab Samples: 10476012001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	05/30/19 13:45	
2,4-Dichlorophenol	ug/L	ND	10.0	05/30/19 13:45	
2,4-Dimethylphenol	ug/L	ND	10.0	05/30/19 13:45	
2,4-Dinitrophenol	ug/L	ND	10.0	05/30/19 13:45	
2-Chlorophenol	ug/L	ND	10.0	05/30/19 13:45	
2-Methylnaphthalene	ug/L	ND	10.0	05/30/19 13:45	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	05/30/19 13:45	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	10.0	05/30/19 13:45	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	05/30/19 13:45	
4-Bromophenylphenyl ether	ug/L	ND	10.0	05/30/19 13:45	
Acenaphthene	ug/L	ND	10.0	05/30/19 13:45	
Anthracene	ug/L	ND	10.0	05/30/19 13:45	
Benzo(a)pyrene	ug/L	ND	10.0	05/30/19 13:45	
Benzoic acid	ug/L	ND	50.0	05/30/19 13:45	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	05/30/19 13:45	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	05/30/19 13:45	
Butylbenzylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Di-n-butylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Di-n-octylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Diethylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Dimethylphthalate	ug/L	ND	10.0	05/30/19 13:45	
Fluoranthene	ug/L	ND	10.0	05/30/19 13:45	
Fluorene	ug/L	ND	10.0	05/30/19 13:45	
Hexachlorobenzene	ug/L	ND	10.0	05/30/19 13:45	
Hexachlorocyclopentadiene	ug/L	ND	50.0	05/30/19 13:45	
Hexachloroethane	ug/L	ND	10.0	05/30/19 13:45	
Isophorone	ug/L	ND	10.0	05/30/19 13:45	
N-Nitrosodimethylamine	ug/L	ND	10.0	05/30/19 13:45	
Pentachlorophenol	ug/L	ND	20.0	05/30/19 13:45	
Phenanthrene	ug/L	ND	10.0	05/30/19 13:45	
Phenol	ug/L	ND	10.0	05/30/19 13:45	
Pyrene	ug/L	ND	10.0	05/30/19 13:45	
2,4,6-Tribromophenol (S)	%	87	52-125	05/30/19 13:45	
2-Fluorobiphenyl (S)	%	69	52-125	05/30/19 13:45	
2-Fluorophenol (S)	%	62	30-125	05/30/19 13:45	
Nitrobenzene-d5 (S)	%	66	55-125	05/30/19 13:45	
p-Terphenyl-d14 (S)	%	90	57-125	05/30/19 13:45	
Phenol-d6 (S)	%	61	30-125	05/30/19 13:45	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

LABORATORY CONTROL SAMPLE & LCSD: 3284580

3284581

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	43.9	44.6	88	89	60-125	2	20	
2,4-Dichlorophenol	ug/L	50	40.8	40.8	82	82	56-125	0	20	
2,4-Dimethylphenol	ug/L	50	36.5	36.6	73	73	33-125	0	20	
2,4-Dinitrophenol	ug/L	50	43.8	43.9	88	88	32-125	0	20	
2-Chlorophenol	ug/L	50	36.5	38.0	73	76	52-125	4	20	
2-Methylnaphthalene	ug/L	50	40.5	41.2	81	82	52-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	37.5	37.8	75	76	55-125	1	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	38.6	38.3	77	77	57-125	1	20	
3,3'-Dichlorobenzidine	ug/L	50	47.2J	50.3	94	101	39-150		20	
4-Bromophenylphenyl ether	ug/L	50	45.0	45.6	90	91	61-125	1	20	
Acenaphthene	ug/L	50	42.7	43.5	85	87	59-125	2	20	
Anthracene	ug/L	50	44.0	45.0	88	90	64-125	2	20	
Benzo(a)pyrene	ug/L	50	44.9	46.3	90	93	63-125	3	20	
Benzoic acid	ug/L	50	31.4J	24.3J	63	49	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	34.9	35.8	70	72	49-125	3	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	43.8	44.6	88	89	68-125	2	20	
Butylbenzylphthalate	ug/L	50	44.2	45.8	88	92	67-125	4	20	
Di-n-butylphthalate	ug/L	50	43.8	45.4	88	91	67-125	4	20	
Di-n-octylphthalate	ug/L	50	43.2	44.5	86	89	67-125	3	20	
Diethylphthalate	ug/L	50	44.2	45.8	88	92	64-125	3	20	
Dimethylphthalate	ug/L	50	44.6	45.2	89	90	65-125	2	20	
Fluoranthene	ug/L	50	44.1	45.0	88	90	64-125	2	20	
Fluorene	ug/L	50	43.3	44.1	87	88	63-125	2	20	
Hexachlorobenzene	ug/L	50	44.9	45.7	90	91	61-125	2	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	39	37	30-125		20	1M
Hexachloroethane	ug/L	50	32.0	33.0	64	66	30-125	3	20	
Isophorone	ug/L	50	41.7	42.7	83	85	59-125	2	20	
N-Nitrosodimethylamine	ug/L	50	34.4	35.1	69	70	43-125	2	20	
Pentachlorophenol	ug/L	50	39.7	38.2	79	76	35-125	4	20	
Phenanthrene	ug/L	50	43.9	44.2	88	88	65-125	1	20	
Phenol	ug/L	50	36.7	37.5	73	75	54-125	2	20	
Pyrene	ug/L	50	43.5	45.5	87	91	65-125	5	20	
2,4,6-Tribromophenol (S)	%				95	98	52-125			
2-Fluorobiphenyl (S)	%				77	76	52-125			
2-Fluorophenol (S)	%				68	70	30-125			
Nitrobenzene-d5 (S)	%				74	75	55-125			
p-Terphenyl-d14 (S)	%				90	92	57-125			
Phenol-d6 (S)	%				72	73	30-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

QC Batch: 608153	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10476012001	

METHOD BLANK: 3287321 Matrix: Water
Associated Lab Samples: 10476012001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	05/23/19 20:30	

LABORATORY CONTROL SAMPLE: 3287322

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.1	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3287323 3287324

Parameter	Units	10476067001		3287323		3287324		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Chloride	mg/L	4.8	12.5	12.5	17.7	17.6	104	103	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3287325 3287326

Parameter	Units	10476067002		3287325		3287326		% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Chloride	mg/L	4.0	12.5	12.5	17.0	16.8	103	102	90-110	1	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

QC Batch: 607489	Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified	Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10476012001	

METHOD BLANK: 3284059 Matrix: Water
Associated Lab Samples: 10476012001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	05/22/19 07:23	

LABORATORY CONTROL SAMPLE: 3284060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3284061 3284062

Parameter	Units	MS		MSD		% Rec		% Rec Limits	RPD	Max RPD	Qual
		10475854001 Result	Spike Conc.	Spike Conc.	Result	Result	% Rec				
Chromium, Hexavalent	mg/L	ND	0.2	0.2	0.12	0.12	60	61	85-115	1	20 M1

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

WORKORDER QUALIFIERS

WO: 10476012

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 608183

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

S0 Surrogate recovery outside laboratory control limits.

S4 Surrogate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476012

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10476012001	813763	EPA Mod. 3510C	607602	EPA 8082A	608183
10476012001	813763	EPA 200.7	608670	EPA 200.7	608907
10476012001	813763	EPA 200.8	609219	EPA 200.8	610407
10476012001	813763	EPA 3520	607604	EPA 8270D	609407
10476012001	813763	EPA 300.0	608153		
10476012001	813763	SM 3500-Cr B Modified	607489		

REPORT OF LABORATORY ANALYSIS

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Minnesota Pollution Control Agency

Chain-of-Custody Form revision 2013.0909

Work Order Number: _____

Turnaround Time: _____

WO# 10476012

10476012

Page: 1 of 1

FOR LAB USE ONLY

Lab Work Order Sticker

PROJECT/CLIENT INFO

Facility Code: MNSW-057	Program Code (MDH Lab Only):	Lab Name: Pace Analytical - Minneapolis, MN
Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters	Project Task Code: PRJ07786	Address: 1700 SE Elm Street
Project Manager: Brad Jacobson	612-607-6375	EPIC PROFILE #: 38716 Line 2
Potential Hazard?	If yes, add information to Sampler Comments Section	
	Minneapolis	MN 55414
	Phone No: 612-607-6400	

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES				LAB MATRIX CODES				FIELD MATRIX CODES				PRESERV.		ANALYSIS		Lab Sample No.	#		
Sample-Routine Sample	QC-FB=Field Blank Sample	DW=Drinking Water	AR=Air	Wtr-Ground=Groundwater	None	None	None	None	None	None	None	None	None	None	None				
S-IVP=Integrated Vertical Profile Sample	QC-FR=Field Replicate Sample	NW=Non-potable Water	BL=Biological Material	Wtr-Surf=Surface Water	None	HNO3	None	H2SO4	None	None	None	None	None	None	None				
Sample	QC-TB=Trip Blank Sample	SD=Soil/Solid	OT=Other	QC-BLANK=Artificial Blank Water	None		None		None	None	None	None	None	None	None				
S-CWOP=Composite Sample		WP=Wipe	TS=Tissue	Leachate=Leachate Sample															
Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Trace Metals - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/ Unionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SVOC, 8082, PCBs, PAHs - QAPP Table 3a	Lab Sample No.	#
813763	sample	5/22/19	12:00			G	NW	Wtr-Ground	N	(LMW-3)	4		X	X			X	601	1
									N										2
									N										3
									N										4
									N										5
									N										6
									N										7
									N										8
									N										9
									N										10

Sampled By: David Anderson Sampler's Signature: David Anderson Phone #: _____

Receiving Comments: _____

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) <u>David Anderson / Pace Analytical</u>	<u>5/22/19 / 1345</u>	<u>(AMA) face T=6-8°C</u>	<u>5.22.19, 1348</u>

(1) could only collect 250 HNO3 (filtered), 250 unpreserved, and (2) 6L for sample 813763.

Sample Condition Upon Receipt **Client Name:** MPCA **Project #:** **WO# : 10476012**

Courier: Fed Ex UPS USPS Client
 Pace SpeeDee Commercial See Exception

Tracking Number: _____

PM: JMA **Due Date:** 06/06/19
CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No **Seals Intact?** Yes No **Biological Tissue Frozen?** Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: _____ **Temp Blank?** Yes No

Thermometer: T1(0461) T2(1336) T3(0459)
 T4(0254) T5(0489) **Type of Ice:** Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>7.0</u> °C	Average Corrected Temp (no temp blank only): _____ °C See Exceptions <input checked="" type="checkbox"/>
Correction Factor: <u>-0.2</u>	Cooler Temp Corrected w/temp blank: <u>6.8</u> °C	

USDA Regulated Soil: (N/A, water sample/Other: _____) **Date/Initials of Person Examining Contents:** CG 5/22/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: See Exception <input type="checkbox"/>
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>11</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input type="checkbox"/> No See Exception <input checked="" type="checkbox"/>
	Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No pH Paper Lot#
	Res. Chlorine 0-6 Roll <u>203619</u> 0-6 Strip 0-14 Strip
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. See Exception <input type="checkbox"/>
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): <u>N/A</u>
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: J. Anderson **Date:** 05/22/2019

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: C.G.

June 18, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476684

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on May 28, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
 A2LA Certification #: 2926.01
 Alabama Certification #: 40770
 Alaska Contaminated Sites Certification #: 17-009
 Alaska DW Certification #: MN00064
 Arizona Certification #: AZ0014
 Arkansas DW Certification #: MN00064
 Arkansas WW Certification #: 88-0680
 California Certification #: 2929
 CNMI Saipan Certification #: MP0003
 Colorado Certification #: MN00064
 Connecticut Certification #: PH-0256
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
 Florida Certification #: E87605
 Georgia Certification #: 959
 Guam EPA Certification #: MN00064
 Hawaii Certification #: MN00064
 Idaho Certification #: MN00064
 Illinois Certification #: 200011
 Indiana Certification #: C-MN-01
 Iowa Certification #: 368
 Kansas Certification #: E-10167
 Kentucky DW Certification #: 90062
 Kentucky WW Certification #: 90062
 Louisiana DEQ Certification #: 03086
 Louisiana DW Certification #: MN00064
 Maine Certification #: MN00064
 Maryland Certification #: 322
 Massachusetts Certification #: M-MN064
 Michigan Certification #: 9909
 Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
 Minnesota Petrofund Certification #: 1240
 Mississippi Certification #: MN00064
 Missouri Certification #: 10100
 Montana Certification #: CERT0092
 Nebraska Certification #: NE-OS-18-06
 Nevada Certification #: MN00064
 New Hampshire Certification #: 2081
 New Jersey Certification #: MN002
 New York Certification #: 11647
 North Carolina DW Certification #: 27700
 North Carolina WW Certification #: 530
 North Dakota Certification #: R-036
 Ohio DW Certification #: 41244
 Ohio VAP Certification #: CL101
 Oklahoma Certification #: 9507
 Oregon Primary Certification #: MN300001
 Oregon Secondary Certification #: MN200001
 Pennsylvania Certification #: 68-00563
 Puerto Rico Certification #: MN00064
 South Carolina Certification #: 74003001
 Tennessee Certification #: TN02818
 Texas Certification #: T104704192
 Utah Certification #: MN00064
 Vermont Certification #: VT-027053137
 Virginia Certification #: 460163
 Washington Certification #: C486
 West Virginia DEP Certification #: 382
 West Virginia DW Certification #: 9952 C
 Wisconsin Certification #: 999407970
 Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
 Montana Certificate #CERT0103
 Alaska Certification UST-107
 Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
 Wisconsin DNR Certification #: 998027470
 WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
 ANAB DOD-ELAP Rad Accreditation #: L2417
 Alabama Certification #: 41590
 Arizona Certification #: AZ0734
 Arkansas Certification
 California Certification #: 04222CA
 Colorado Certification #: PA01547
 Connecticut Certification #: PH-0694
 Delaware Certification
 EPA Region 4 DW Rad
 Florida/TNI Certification #: E87683

Georgia Certification #: C040
 Guam Certification
 Florida: Cert E871149 SEKS WET
 Hawaii Certification
 Idaho Certification
 Illinois Certification
 Indiana Certification
 Iowa Certification #: 391
 Kansas/TNI Certification #: E-10358
 Kentucky Certification #: KY90133
 KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10476684001	834657	Water	05/28/19 10:00	05/28/19 15:01
10476684002	834656	Water	05/28/19 12:00	05/28/19 15:01
10476684003	834655	Water	05/28/19 14:00	05/28/19 15:01

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10476684001	834657	EPA 8082A	RAG	11	PASI-M		
		EPA 200.7	DM	9	PASI-M		
		EPA 200.8	BWB, PW1	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	NEG	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		
		10476684002	834656	EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
EPA 200.8	BWB, PW1			12	PASI-M		
EPA 8270D	STB			38	PASI-M		
	CLJ			16	PASI-V		
EPA 900.0	NEG			2	PASI-PA		
EPA 300.0	KEO			1	PASI-M		
SM 3500-Cr B Modified	JFP			1	PASI-M		
EPA 350.1	CLJ			1	PASI-V		
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V		
SM 4500-CN-E	DCL			1	PASI-M		
10476684003	834655			EPA 8082A	RAG	11	PASI-M
				EPA 200.7	DM	9	PASI-M
		EPA 200.8	BWB, PW1	12	PASI-M		
		EPA 8270D	STB	38	PASI-M		
			CLJ	16	PASI-V		
		EPA 900.0	NEG	2	PASI-PA		
		EPA 300.0	KEO	1	PASI-M		
		SM 3500-Cr B Modified	JFP	1	PASI-M		
		EPA 350.1	CLJ	1	PASI-V		
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V		
		SM 4500-CN-E	DCL	1	PASI-M		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Sample Project No.: 10476684

Sample: 834657	Lab ID: 10476684001	Collected: 05/28/19 10:00	Received: 05/28/19 15:01	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	11104-28-2	
PCB-1232 (Aroclor 1232)	0.25	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:36	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	50	%	30-125	1	05/30/19 09:04	06/01/19 00:36	877-09-8	
Decachlorobiphenyl (S)	54	%	30-125	1	05/30/19 09:04	06/01/19 00:36	2051-24-3	
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	06/03/19 10:23	06/04/19 12:08	7429-90-5	
Barium, Dissolved	205	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:08	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:08	7440-50-8	
Manganese, Dissolved	556	ug/L	5.0	1	06/03/19 10:23	06/04/19 12:08	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:08	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:08	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	06/03/19 10:23	06/04/19 12:08	7440-31-5	
Total Hardness by 2340B, Dissolved	310000	ug/L	3300	1	06/03/19 10:23	06/04/19 12:08		
Zinc, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:08	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:42	7440-36-0	
Arsenic, Dissolved	1.3	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:42	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/03/19 10:23	06/05/19 11:42	7440-41-7	
Boron, Dissolved	224	ug/L	10.0	1	06/03/19 10:23	06/06/19 16:25	7440-42-8	
Cadmium, Dissolved	0.26	ug/L	0.080	1	06/03/19 10:23	06/05/19 11:42	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:42	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:42	7440-48-4	
Lead, Dissolved	2.3	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:42	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:42	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:42	7440-28-0	
Uranium, Dissolved	0.67	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:42	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/03/19 10:23	06/05/19 11:42	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	83-32-9	
Anthracene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	50-32-8	
Benzoic acid	ND	ug/L	49.0	1	05/29/19 17:40	06/04/19 14:04	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Sample: 834657 **Lab ID: 10476684001** Collected: 05/28/19 10:00 Received: 05/28/19 15:01 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
------------	---------	-------	--------------	----	----------	----------	---------	------

8270D MSSV

Analytical Method: EPA 8270D Preparation Method: EPA 3520

2-Chlorophenol	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.0	1	05/29/19 17:40	06/04/19 14:04	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	206-44-0	
Fluorene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.0	1	05/29/19 17:40	06/04/19 14:04	77-47-4	L2
Hexachloroethane	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	67-72-1	
Isophorone	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	62-75-9	
Pentachlorophenol	ND	ug/L	19.6	1	05/29/19 17:40	06/04/19 14:04	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	85-01-8	
Phenol	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	108-95-2	
Pyrene	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	05/29/19 17:40	06/04/19 14:04	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	65	%.	55-125	1	05/29/19 17:40	06/04/19 14:04	4165-60-0	
2-Fluorobiphenyl (S)	52	%.	52-125	1	05/29/19 17:40	06/04/19 14:04	321-60-8	
p-Terphenyl-d14 (S)	63	%.	57-125	1	05/29/19 17:40	06/04/19 14:04	1718-51-0	
Phenol-d6 (S)	62	%.	30-125	1	05/29/19 17:40	06/04/19 14:04	13127-88-3	
2-Fluorophenol (S)	61	%.	30-125	1	05/29/19 17:40	06/04/19 14:04	367-12-4	
2,4,6-Tribromophenol (S)	70	%.	52-125	1	05/29/19 17:40	06/04/19 14:04	118-79-6	

Field Data

Analytical Method:

Collected Date	05/28/19			1		05/28/19 10:00		
Collected Time	1000			1		05/28/19 10:00		
Field pH	6.0	Std. Units		1		05/28/19 10:00		
Field Temperature	9.5	deg C		1		05/28/19 10:00		
Field Specific Conductance	790	umhos/cm		1		05/28/19 10:00		
Oxygen, Dissolved	1.1	mg/L		1		05/28/19 10:00	7782-44-7	
REDOX	-69	mV		1		05/28/19 10:00		
Turbidity	4.8	NTU		1		05/28/19 10:00		
Apparent Color	Clear			1		05/28/19 10:00		
Odor	No			1		05/28/19 10:00		
Well Locked	Bolted			1		05/28/19 10:00		
	Down							

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Sample: 834657		Lab ID: 10476684001		Collected: 05/28/19 10:00	Received: 05/28/19 15:01	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Purge Method	Peristaltic Pump			1		05/28/19 10:00		
Total Well Depth	20.32	feet		1		05/28/19 10:00		
Depth of Water	4.50			1		05/28/19 10:00		
Well Volume Purged	7.8			1		05/28/19 10:00		
Purge Rate	0.2			1		05/28/19 10:00		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	57.2	mg/L	1.2	1		06/12/19 16:54	16887-00-6	M1
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	0.016	mg/L	0.010	1		05/29/19 09:19		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/18/19 16:02		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	1.5	mg/L	0.11	1	06/04/19 08:44	06/04/19 11:13	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	06/05/19 08:51	06/05/19 12:16	57-12-5	

Sample: 834656		Lab ID: 10476684002		Collected: 05/28/19 12:00	Received: 05/28/19 15:01	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	11104-28-2	
PCB-1232 (Aroclor 1232)	0.67	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:51	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	50	%	30-125	1	05/30/19 09:04	06/01/19 00:51	877-09-8	
Decachlorobiphenyl (S)	40	%	30-125	1	05/30/19 09:04	06/01/19 00:51	2051-24-3	
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	06/03/19 10:23	06/04/19 12:18	7429-90-5	
Barium, Dissolved	185	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:18	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:18	7440-50-8	
Manganese, Dissolved	4020	ug/L	5.0	1	06/03/19 10:23	06/04/19 12:18	7439-96-5	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Sample: 834656		Lab ID: 10476684002	Collected: 05/28/19 12:00	Received: 05/28/19 15:01	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Nickel, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:18	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:18	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	06/03/19 10:23	06/04/19 12:18	7440-31-5	
Total Hardness by 2340B, Dissolved	833000	ug/L	3300	1	06/03/19 10:23	06/04/19 12:18		
Zinc, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:18	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:48	7440-36-0	
Arsenic, Dissolved	1.6	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:48	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/03/19 10:23	06/05/19 11:48	7440-41-7	
Boron, Dissolved	1760	ug/L	100	10	06/03/19 10:23	06/06/19 16:28	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	06/03/19 10:23	06/05/19 11:48	7440-43-9	
Chromium, Dissolved	0.58	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:48	7440-47-3	
Cobalt, Dissolved	0.83	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:48	7440-48-4	
Lead, Dissolved	0.29	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:48	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:48	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:48	7440-28-0	
Uranium, Dissolved	1.2	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:48	7440-61-1	
Vanadium, Dissolved	1.8	ug/L	1.0	1	06/03/19 10:23	06/05/19 11:48	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	83-32-9	
Anthracene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	50-32-8	
Benzoic acid	ND	ug/L	49.3	1	05/29/19 17:40	06/04/19 14:31	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	111-44-4	
2-Chlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.3	1	05/29/19 17:40	06/04/19 14:31	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	120-83-2	
Diethylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	105-67-9	
Dimethylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	117-81-7	
Fluoranthene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	206-44-0	
Fluorene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	86-73-7	
Hexachlorobenzene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.3	1	05/29/19 17:40	06/04/19 14:31	77-47-4	L2
Hexachloroethane	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	67-72-1	
Isophorone	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	95-48-7	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Sample: 834656	Lab ID: 10476684002	Collected: 05/28/19 12:00	Received: 05/28/19 15:01	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
3&4-Methylphenol(m&p Cresol)	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31		
N-Nitrosodimethylamine	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	62-75-9	
Pentachlorophenol	ND	ug/L	19.7	1	05/29/19 17:40	06/04/19 14:31	87-86-5	
Phenanthrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	85-01-8	
Phenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	108-95-2	
Pyrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 14:31	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	66	%	55-125	1	05/29/19 17:40	06/04/19 14:31	4165-60-0	
2-Fluorobiphenyl (S)	56	%	52-125	1	05/29/19 17:40	06/04/19 14:31	321-60-8	
p-Terphenyl-d14 (S)	78	%	57-125	1	05/29/19 17:40	06/04/19 14:31	1718-51-0	
Phenol-d6 (S)	65	%	30-125	1	05/29/19 17:40	06/04/19 14:31	13127-88-3	
2-Fluorophenol (S)	61	%	30-125	1	05/29/19 17:40	06/04/19 14:31	367-12-4	
2,4,6-Tribromophenol (S)	89	%	52-125	1	05/29/19 17:40	06/04/19 14:31	118-79-6	
Field Data		Analytical Method:						
Collected Date	05/28/19			1		05/28/19 12:00		
Collected Time	1200			1		05/28/19 12:00		
Field pH	6.6	Std. Units		1		05/28/19 12:00		
Field Temperature	9.0	deg C		1		05/28/19 12:00		
Field Specific Conductance	1870	umhos/cm		1		05/28/19 12:00		
Oxygen, Dissolved	0.4	mg/L		1		05/28/19 12:00	7782-44-7	
REDOX	-100	mV		1		05/28/19 12:00		
Turbidity	4.6	NTU		1		05/28/19 12:00		
Apparent Color	Clear			1		05/28/19 12:00		
Odor	No			1		05/28/19 12:00		
Well Locked	Bolted Down			1		05/28/19 12:00		
Purge Method	Peristaltic Pump			1		05/28/19 12:00		
Total Well Depth	20.33	feet		1		05/28/19 12:00		
Depth of Water	3.50			1		05/28/19 12:00		
Well Volume Purged	8.4			1		05/28/19 12:00		
Purge Rate	0.2			1		05/28/19 12:00		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	75.6	mg/L	1.2	1		06/12/19 20:48	16887-00-6	M1
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	0.025	mg/L	0.010	1		05/29/19 09:19		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/18/19 16:03		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	3.7	mg/L	0.11	1	06/04/19 08:44	06/04/19 11:17	7664-41-7	

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Sample: 834656	Lab ID: 10476684002	Collected: 05/28/19 12:00	Received: 05/28/19 15:01	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

SM4500CN-E Cyanide Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E

Cyanide	21.0	ug/L	20.0	1	06/05/19 08:51	06/05/19 12:17	57-12-5	
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Sample: 834655	Lab ID: 10476684003	Collected: 05/28/19 14:00	Received: 05/28/19 15:01	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

8082A GCS PCB Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C

PCB-1016 (Aroclor 1016)	ND	ug/L	0.097	1	05/30/19 09:04	06/01/19 01:06	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.097	1	05/30/19 09:04	06/01/19 01:06	11104-28-2	
PCB-1232 (Aroclor 1232)	31.3	ug/L	0.97	10	05/30/19 09:04	06/03/19 11:02	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.097	1	05/30/19 09:04	06/01/19 01:06	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.097	1	05/30/19 09:04	06/01/19 01:06	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.097	1	05/30/19 09:04	06/01/19 01:06	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.097	1	05/30/19 09:04	06/01/19 01:06	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.097	1	05/30/19 09:04	06/01/19 01:06	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.097	1	05/30/19 09:04	06/01/19 01:06	11100-14-4	

Surrogates

Tetrachloro-m-xylene (S)	43	%	30-125	1	05/30/19 09:04	06/01/19 01:06	877-09-8	
Decachlorobiphenyl (S)	25	%	30-125	1	05/30/19 09:04	06/01/19 01:06	2051-24-3	SO

200.7 MET ICP, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7

Aluminum, Dissolved	ND	ug/L	200	1	06/03/19 10:23	06/04/19 12:20	7429-90-5	
Barium, Dissolved	369	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:20	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:20	7440-50-8	
Manganese, Dissolved	1430	ug/L	5.0	1	06/03/19 10:23	06/04/19 12:20	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:20	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/03/19 10:23	06/04/19 12:20	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	06/03/19 10:23	06/04/19 12:20	7440-31-5	
Total Hardness by 2340B, Dissolved	550000	ug/L	3300	1	06/03/19 10:23	06/04/19 12:20		
Zinc, Dissolved	ND	ug/L	20.0	1	06/03/19 10:23	06/04/19 12:20	7440-66-6	

200.8 MET ICPMS, Dissolved Analytical Method: EPA 200.8 Preparation Method: EPA 200.8

Antimony, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:54	7440-36-0	
Arsenic, Dissolved	2.2	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:54	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/03/19 10:23	06/05/19 11:54	7440-41-7	
Boron, Dissolved	345	ug/L	10.0	1	06/03/19 10:23	06/06/19 16:31	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	06/03/19 10:23	06/05/19 11:54	7440-43-9	
Chromium, Dissolved	1.5	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:54	7440-47-3	
Cobalt, Dissolved	3.0	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:54	7440-48-4	
Lead, Dissolved	0.21	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:54	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:54	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	06/03/19 10:23	06/05/19 11:54	7440-28-0	
Uranium, Dissolved	0.58	ug/L	0.50	1	06/03/19 10:23	06/05/19 11:54	7440-61-1	
Vanadium, Dissolved	1.6	ug/L	1.0	1	06/03/19 10:23	06/05/19 11:54	7440-62-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Sample: 834655	Lab ID: 10476684003	Collected: 05/28/19 14:00	Received: 05/28/19 15:01	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	83-32-9	
Anthracene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	50-32-8	
Benzoic acid	ND	ug/L	48.1	1	05/29/19 17:40	06/04/19 14:58	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	111-44-4	
2-Chlorophenol	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	48.1	1	05/29/19 17:40	06/04/19 14:58	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	120-83-2	
Diethylphthalate	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	105-67-9	
Dimethylphthalate	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	117-81-7	
Fluoranthene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	206-44-0	
Fluorene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	86-73-7	
Hexachlorobenzene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	48.1	1	05/29/19 17:40	06/04/19 14:58	77-47-4	L2
Hexachloroethane	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	67-72-1	
Isophorone	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58		
N-Nitrosodimethylamine	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	62-75-9	
Pentachlorophenol	ND	ug/L	19.2	1	05/29/19 17:40	06/04/19 14:58	87-86-5	
Phenanthrene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	85-01-8	
Phenol	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	108-95-2	
Pyrene	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.6	1	05/29/19 17:40	06/04/19 14:58	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	66	%	55-125	1	05/29/19 17:40	06/04/19 14:58	4165-60-0	
2-Fluorobiphenyl (S)	56	%	52-125	1	05/29/19 17:40	06/04/19 14:58	321-60-8	
p-Terphenyl-d14 (S)	65	%	57-125	1	05/29/19 17:40	06/04/19 14:58	1718-51-0	
Phenol-d6 (S)	65	%	30-125	1	05/29/19 17:40	06/04/19 14:58	13127-88-3	
2-Fluorophenol (S)	61	%	30-125	1	05/29/19 17:40	06/04/19 14:58	367-12-4	
2,4,6-Tribromophenol (S)	77	%	52-125	1	05/29/19 17:40	06/04/19 14:58	118-79-6	

Field Data

Analytical Method:

Collected Date	05/28/19			1	05/28/19 14:00		
Collected Time	1400			1	05/28/19 14:00		
Field pH	6.4	Std. Units		1	05/28/19 14:00		
Field Temperature	10.5	deg C		1	05/28/19 14:00		
Field Specific Conductance	1230	umhos/cm		1	05/28/19 14:00		
Oxygen, Dissolved	2.3	mg/L		1	05/28/19 14:00	7782-44-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Sample: 834655	Lab ID: 10476684003	Collected: 05/28/19 14:00	Received: 05/28/19 15:01	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
REDOX	-65	mV		1		05/28/19 14:00		
Turbidity	9.8	NTU		1		05/28/19 14:00		
Apparent Color	Clear			1		05/28/19 14:00		
Odor	No			1		05/28/19 14:00		
Well Locked	Bolted Down			1		05/28/19 14:00		
Purge Method	Peristaltic Pump			1		05/28/19 14:00		
Total Well Depth	20.30	feet		1		05/28/19 14:00		
Depth of Water	4.03			1		05/28/19 14:00		
Well Volume Purged	8.4			1		05/28/19 14:00		
Purge Rate	0.2			1		05/28/19 14:00		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	19.9	mg/L	1.2	1		06/13/19 06:29	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	0.025	mg/L	0.010	1		05/29/19 09:19		
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/18/19 16:03		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	10.6	mg/L	0.55	5	06/04/19 08:44	06/04/19 11:37	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	06/11/19 09:01	06/11/19 11:51	57-12-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

QC Batch: 609218 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10476684001, 10476684002, 10476684003

METHOD BLANK: 3292563 Matrix: Water

Associated Lab Samples: 10476684001, 10476684002, 10476684003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	06/04/19 11:53	
Barium, Dissolved	ug/L	ND	10.0	06/04/19 11:53	
Copper, Dissolved	ug/L	ND	10.0	06/04/19 11:53	
Manganese, Dissolved	ug/L	ND	5.0	06/04/19 11:53	
Nickel, Dissolved	ug/L	ND	20.0	06/04/19 11:53	
Silver, Dissolved	ug/L	ND	10.0	06/04/19 11:53	
Tin, Dissolved	ug/L	ND	75.0	06/04/19 11:53	
Zinc, Dissolved	ug/L	ND	20.0	06/04/19 11:53	

LABORATORY CONTROL SAMPLE: 3292564

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21200	106	85-115	
Barium, Dissolved	ug/L	1000	1020	102	85-115	
Copper, Dissolved	ug/L	1000	976	98	85-115	
Manganese, Dissolved	ug/L	1000	1020	102	85-115	
Nickel, Dissolved	ug/L	1000	1000	100	85-115	
Silver, Dissolved	ug/L	500	502	100	85-115	
Tin, Dissolved	ug/L	1000	1000	100	85-115	
Zinc, Dissolved	ug/L	1000	1020	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292565 3292566

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10475854002 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	22200	22000	111	110	70-130	1	20
Barium, Dissolved	ug/L	25.9	1000	1000	1050	1040	102	102	70-130	1	20
Copper, Dissolved	ug/L	ND	1000	1000	1020	1010	102	101	70-130	1	20
Manganese, Dissolved	ug/L	244	1000	1000	1270	1270	103	103	70-130	0	20
Nickel, Dissolved	ug/L	ND	1000	1000	980	972	98	97	70-130	1	20
Silver, Dissolved	ug/L	ND	500	500	528	522	106	104	70-130	1	20
Tin, Dissolved	ug/L	ND	1000	1000	1000	978	100	98	70-130	2	20
Zinc, Dissolved	ug/L	ND	1000	1000	990	983	99	98	70-130	1	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476684

QC Batch: 609219 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10476684001, 10476684002, 10476684003

METHOD BLANK: 3292568 Matrix: Water
Associated Lab Samples: 10476684001, 10476684002, 10476684003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Arsenic, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Beryllium, Dissolved	ug/L	ND	0.20	06/05/19 09:44	
Boron, Dissolved	ug/L	ND	10.0	06/05/19 09:44	
Cadmium, Dissolved	ug/L	ND	0.080	06/05/19 09:44	
Chromium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Cobalt, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Lead, Dissolved	ug/L	ND	0.10	06/05/19 09:44	
Selenium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Thallium, Dissolved	ug/L	ND	0.10	06/05/19 09:44	
Uranium, Dissolved	ug/L	ND	0.50	06/05/19 09:44	
Vanadium, Dissolved	ug/L	ND	1.0	06/05/19 09:44	

LABORATORY CONTROL SAMPLE: 3292569

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	106	106	85-115	
Arsenic, Dissolved	ug/L	100	101	101	85-115	
Beryllium, Dissolved	ug/L	100	94.2	94	85-115	
Boron, Dissolved	ug/L	100	99.9	100	85-115	
Cadmium, Dissolved	ug/L	100	101	101	85-115	
Chromium, Dissolved	ug/L	100	102	102	85-115	
Cobalt, Dissolved	ug/L	100	104	104	85-115	
Lead, Dissolved	ug/L	100	104	104	85-115	
Selenium, Dissolved	ug/L	100	112	112	85-115	
Thallium, Dissolved	ug/L	100	111	111	85-115	
Uranium, Dissolved	ug/L	100	98.2	98	85-115	
Vanadium, Dissolved	ug/L	100	99.8	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292570 3292571

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10476128001 Result	Spike Conc.	Spike Conc.	Result							Result
Antimony, Dissolved	ug/L	ND	100	100	108	108	107	108	70-130	1	20	
Arsenic, Dissolved	ug/L	ND	100	100	102	102	101	102	70-130	1	20	
Beryllium, Dissolved	ug/L	ND	100	100	96.3	96.0	96	96	70-130	0	20	
Boron, Dissolved	ug/L	77.5	100	100	167	168	89	90	70-130	1	20	
Cadmium, Dissolved	ug/L	0.13	100	100	95.8	97.8	96	98	70-130	2	20	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292570												3292571	
Parameter	Units	10476128001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Chromium, Dissolved	ug/L	ND	100	100	108	109	108	109	70-130	1	20		
Cobalt, Dissolved	ug/L	ND	100	100	104	105	104	105	70-130	1	20		
Lead, Dissolved	ug/L	0.11	100	100	95.6	96.7	96	97	70-130	1	20		
Selenium, Dissolved	ug/L	2.7	100	100	114	116	111	113	70-130	2	20		
Thallium, Dissolved	ug/L	0.11	100	100	103	104	103	104	70-130	1	20		
Uranium, Dissolved	ug/L	11.5	100	100	111	110	99	98	70-130	1	20		
Vanadium, Dissolved	ug/L	ND	100	100	111	113	110	112	70-130	1	20		

MATRIX SPIKE SAMPLE: 3292572											
Parameter	Units	10476128003 Result	Spike	MS	MS	% Rec	Qualifiers				
			Conc.	Result	% Rec	Limits					
Antimony, Dissolved	ug/L	ND	100	105	105	70-130					
Arsenic, Dissolved	ug/L	ND	100	101	101	70-130					
Beryllium, Dissolved	ug/L	ND	100	97.9	98	70-130					
Boron, Dissolved	ug/L	13.2	100	116	103	70-130					
Cadmium, Dissolved	ug/L	ND	100	99.9	100	70-130					
Chromium, Dissolved	ug/L	ND	100	104	104	70-130					
Cobalt, Dissolved	ug/L	ND	100	105	105	70-130					
Lead, Dissolved	ug/L	ND	100	102	102	70-130					
Selenium, Dissolved	ug/L	ND	100	110	110	70-130					
Thallium, Dissolved	ug/L	ND	100	108	108	70-130					
Uranium, Dissolved	ug/L	ND	100	98.1	98	70-130					
Vanadium, Dissolved	ug/L	ND	100	103	103	70-130					

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476684

QC Batch: 609269 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10476684001, 10476684002, 10476684003

METHOD BLANK: 3292705 Matrix: Water
Associated Lab Samples: 10476684001, 10476684002, 10476684003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	05/31/19 21:34	
Decachlorobiphenyl (S)	%	81	30-125	05/31/19 21:34	
Tetrachloro-m-xylene (S)	%	66	30-125	05/31/19 21:34	

LABORATORY CONTROL SAMPLE: 3292706

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	2.0	98	45-125	
PCB-1260 (Aroclor 1260)	ug/L	2	2.2	109	49-125	
Decachlorobiphenyl (S)	%			96	30-125	
Tetrachloro-m-xylene (S)	%			70	30-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292707 3292708

Parameter	Units	10476522001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
PCB-1016 (Aroclor 1016)	ug/L	<0.099	2	2	1.3	1.2	65	61	30-150	7	30		
PCB-1260 (Aroclor 1260)	ug/L	<0.099	2	2	1.7	1.5	84	73	30-150	15	30		
Decachlorobiphenyl (S)	%						70	55	30-125				
Tetrachloro-m-xylene (S)	%						41	40	30-125				

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476684

QC Batch: 609142 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10476684001, 10476684002, 10476684003

METHOD BLANK: 3291948 Matrix: Water
Associated Lab Samples: 10476684001, 10476684002, 10476684003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	06/04/19 10:55	
2,4-Dichlorophenol	ug/L	ND	10.0	06/04/19 10:55	
2,4-Dimethylphenol	ug/L	ND	10.0	06/04/19 10:55	
2,4-Dinitrophenol	ug/L	ND	10.0	06/04/19 10:55	
2-Chlorophenol	ug/L	ND	10.0	06/04/19 10:55	
2-Methylnaphthalene	ug/L	ND	10.0	06/04/19 10:55	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	06/04/19 10:55	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	10.0	06/04/19 10:55	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	06/04/19 10:55	
4-Bromophenylphenyl ether	ug/L	ND	10.0	06/04/19 10:55	
Acenaphthene	ug/L	ND	10.0	06/04/19 10:55	
Anthracene	ug/L	ND	10.0	06/04/19 10:55	
Benzo(a)pyrene	ug/L	ND	10.0	06/04/19 10:55	
Benzoic acid	ug/L	ND	50.0	06/04/19 10:55	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	06/04/19 10:55	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	06/04/19 10:55	
Butylbenzylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Di-n-butylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Di-n-octylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Diethylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Dimethylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Fluoranthene	ug/L	ND	10.0	06/04/19 10:55	
Fluorene	ug/L	ND	10.0	06/04/19 10:55	
Hexachlorobenzene	ug/L	ND	10.0	06/04/19 10:55	
Hexachlorocyclopentadiene	ug/L	ND	50.0	06/04/19 10:55	
Hexachloroethane	ug/L	ND	10.0	06/04/19 10:55	
Isophorone	ug/L	ND	10.0	06/04/19 10:55	
N-Nitrosodimethylamine	ug/L	ND	10.0	06/04/19 10:55	
Pentachlorophenol	ug/L	ND	20.0	06/04/19 10:55	
Phenanthrene	ug/L	ND	10.0	06/04/19 10:55	
Phenol	ug/L	ND	10.0	06/04/19 10:55	
Pyrene	ug/L	ND	10.0	06/04/19 10:55	
2,4,6-Tribromophenol (S)	%	79	52-125	06/04/19 10:55	
2-Fluorobiphenyl (S)	%	73	52-125	06/04/19 10:55	
2-Fluorophenol (S)	%	73	30-125	06/04/19 10:55	
Nitrobenzene-d5 (S)	%	79	55-125	06/04/19 10:55	
p-Terphenyl-d14 (S)	%	76	57-125	06/04/19 10:55	
Phenol-d6 (S)	%	74	30-125	06/04/19 10:55	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

LABORATORY CONTROL SAMPLE & LCSD: 3291949

Parameter	Units	Spike Conc.	3291950		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
			LCS Result	LCSD Result						
2,4,6-Trichlorophenol	ug/L	50	41.2	40.9	82	82	60-125	1	20	
2,4-Dichlorophenol	ug/L	50	39.6	39.3	79	79	56-125	1	20	
2,4-Dimethylphenol	ug/L	50	38.8	37.4	78	75	33-125	4	20	
2,4-Dinitrophenol	ug/L	50	29.2	26.1	58	52	32-125	11	20	
2-Chlorophenol	ug/L	50	37.4	38.6	75	77	52-125	3	20	
2-Methylnaphthalene	ug/L	50	40.6	39.6	81	79	52-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	38.8	39.3	78	79	55-125	1	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	39.0	39.0	78	78	57-125	0	20	
3,3'-Dichlorobenzidine	ug/L	50	45.3J	39.2J	91	78	39-150		20	
4-Bromophenylphenyl ether	ug/L	50	43.1	38.0	86	76	61-125	13	20	
Acenaphthene	ug/L	50	43.2	40.1	86	80	59-125	7	20	
Anthracene	ug/L	50	45.7	40.9	91	82	64-125	11	20	
Benzo(a)pyrene	ug/L	50	45.1	39.4	90	79	63-125	13	20	
Benzoic acid	ug/L	50	25.7J	ND	51	37	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	36.5	37.9	73	76	49-125	4	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	44.6	38.7	89	77	68-125	14	20	
Butylbenzylphthalate	ug/L	50	44.3	38.0	89	76	67-125	15	20	
Di-n-butylphthalate	ug/L	50	46.2	40.7	92	81	67-125	13	20	
Di-n-octylphthalate	ug/L	50	44.9	39.4	90	79	67-125	13	20	
Diethylphthalate	ug/L	50	45.1	40.6	90	81	64-125	10	20	
Dimethylphthalate	ug/L	50	44.0	38.8	88	78	65-125	13	20	
Fluoranthene	ug/L	50	45.0	41.6	90	83	64-125	8	20	
Fluorene	ug/L	50	44.8	40.7	90	81	63-125	10	20	
Hexachlorobenzene	ug/L	50	43.5	38.5	87	77	61-125	12	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	32	35	30-125		20	1M
Hexachloroethane	ug/L	50	29.5	31.2	59	62	30-125	5	20	
Isophorone	ug/L	50	42.5	40.2	85	80	59-125	6	20	
N-Nitrosodimethylamine	ug/L	50	36.3	36.2	73	72	43-125	0	20	
Pentachlorophenol	ug/L	50	30.7	27.6	61	55	35-125	11	20	
Phenanthrene	ug/L	50	45.2	40.4	90	81	65-125	11	20	
Phenol	ug/L	50	37.9	38.0	76	76	54-125	0	20	
Pyrene	ug/L	50	44.8	38.3	90	77	65-125	16	20	
2,4,6-Tribromophenol (S)	%				83	75	52-125			
2-Fluorobiphenyl (S)	%				78	76	52-125			
2-Fluorophenol (S)	%				67	69	30-125			
Nitrobenzene-d5 (S)	%				73	74	55-125			
p-Terphenyl-d14 (S)	%				80	69	57-125			
Phenol-d6 (S)	%				69	69	30-125			

LABORATORY CONTROL SAMPLE: 3291969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	40.1	80	60-125	
2,4-Dichlorophenol	ug/L	50	39.7	79	56-125	
2,4-Dimethylphenol	ug/L	50	39.0	78	33-125	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

LABORATORY CONTROL SAMPLE: 3291969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dinitrophenol	ug/L	50	16.6	33	32-125	
2-Chlorophenol	ug/L	50	37.3	75	52-125	
2-Methylnaphthalene	ug/L	50	41.5	83	52-125	
2-Methylphenol(o-Cresol)	ug/L	50	38.0	76	55-125	
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.2	74	57-125	
3,3'-Dichlorobenzidine	ug/L	50	41.7J	83	39-150	
4-Bromophenylphenyl ether	ug/L	50	43.9	88	61-125	
Acenaphthene	ug/L	50	42.4	85	59-125	
Anthracene	ug/L	50	43.6	87	64-125	
Benzo(a)pyrene	ug/L	50	42.5	85	63-125	
Benzoic acid	ug/L	50	24.7J	49	30-125	
bis(2-Chloroethyl) ether	ug/L	50	37.0	74	49-125	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.2	82	68-125	
Butylbenzylphthalate	ug/L	50	41.1	82	67-125	
Di-n-butylphthalate	ug/L	50	43.9	88	67-125	
Di-n-octylphthalate	ug/L	50	42.0	84	67-125	
Diethylphthalate	ug/L	50	44.0	88	64-125	
Dimethylphthalate	ug/L	50	42.5	85	65-125	
Fluoranthene	ug/L	50	43.0	86	64-125	
Fluorene	ug/L	50	43.0	86	63-125	
Hexachlorobenzene	ug/L	50	42.4	85	61-125	
Hexachlorocyclopentadiene	ug/L	50	ND	21	30-125	1M,L2
Hexachloroethane	ug/L	50	29.2	58	30-125	
Isophorone	ug/L	50	42.6	85	59-125	
N-Nitrosodimethylamine	ug/L	50	35.0	70	43-125	
Pentachlorophenol	ug/L	50	29.5	59	35-125	
Phenanthrene	ug/L	50	42.3	85	65-125	
Phenol	ug/L	50	37.9	76	54-125	
Pyrene	ug/L	50	41.0	82	65-125	
2,4,6-Tribromophenol (S)	%			80	52-125	
2-Fluorobiphenyl (S)	%			76	52-125	
2-Fluorophenol (S)	%			67	30-125	
Nitrobenzene-d5 (S)	%			74	55-125	
p-Terphenyl-d14 (S)	%			74	57-125	
Phenol-d6 (S)	%			69	30-125	

LABORATORY CONTROL SAMPLE: 3291970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	42.5	85	60-125	
2,4-Dichlorophenol	ug/L	50	40.2	80	56-125	
2,4-Dimethylphenol	ug/L	50	34.0	68	33-125	
2,4-Dinitrophenol	ug/L	50	17.1	34	32-125	
2-Chlorophenol	ug/L	50	37.9	76	52-125	
2-Methylnaphthalene	ug/L	50	40.7	81	52-125	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

LABORATORY CONTROL SAMPLE: 3291970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Methylphenol(o-Cresol)	ug/L	50	39.0	78	55-125	
3&4-Methylphenol(m&p Cresol)	ug/L	50	40.1	80	57-125	
3,3'-Dichlorobenzidine	ug/L	50	38.5J	77	39-150	
4-Bromophenylphenyl ether	ug/L	50	38.9	78	61-125	
Acenaphthene	ug/L	50	40.4	81	59-125	
Anthracene	ug/L	50	42.3	85	64-125	
Benzo(a)pyrene	ug/L	50	40.5	81	63-125	
Benzoic acid	ug/L	50	34.9J	70	30-125	
bis(2-Chloroethyl) ether	ug/L	50	39.1	78	49-125	
bis(2-Ethylhexyl)phthalate	ug/L	50	40.6	81	68-125	
Butylbenzylphthalate	ug/L	50	39.7	79	67-125	
Di-n-butylphthalate	ug/L	50	43.5	87	67-125	
Di-n-octylphthalate	ug/L	50	41.1	82	67-125	
Diethylphthalate	ug/L	50	41.4	83	64-125	
Dimethylphthalate	ug/L	50	40.6	81	65-125	
Fluoranthene	ug/L	50	43.4	87	64-125	
Fluorene	ug/L	50	41.1	82	63-125	
Hexachlorobenzene	ug/L	50	38.9	78	61-125	
Hexachlorocyclopentadiene	ug/L	50	ND	18	30-125	1M,L2
Hexachloroethane	ug/L	50	30.7	61	30-125	
Isophorone	ug/L	50	40.9	82	59-125	
N-Nitrosodimethylamine	ug/L	50	37.4	75	43-125	
Pentachlorophenol	ug/L	50	29.7	59	35-125	
Phenanthrene	ug/L	50	42.1	84	65-125	
Phenol	ug/L	50	38.0	76	54-125	
Pyrene	ug/L	50	42.2	84	65-125	
2,4,6-Tribromophenol (S)	%			78	52-125	
2-Fluorobiphenyl (S)	%			73	52-125	
2-Fluorophenol (S)	%			68	30-125	
Nitrobenzene-d5 (S)	%			75	55-125	
p-Terphenyl-d14 (S)	%			76	57-125	
Phenol-d6 (S)	%			70	30-125	

LABORATORY CONTROL SAMPLE: 3291971

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	37.5	75	60-125	
2,4-Dichlorophenol	ug/L	50	39.1	78	56-125	
2,4-Dimethylphenol	ug/L	50	30.6	61	33-125	
2,4-Dinitrophenol	ug/L	50	16.6	33	32-125	
2-Chlorophenol	ug/L	50	37.3	75	52-125	
2-Methylnaphthalene	ug/L	50	39.4	79	52-125	
2-Methylphenol(o-Cresol)	ug/L	50	38.1	76	55-125	
3&4-Methylphenol(m&p Cresol)	ug/L	50	38.7	77	57-125	
3,3'-Dichlorobenzidine	ug/L	50	37J	74	39-150	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

LABORATORY CONTROL SAMPLE: 3291971

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4-Bromophenylphenyl ether	ug/L	50	38.5	77	61-125	
Acenaphthene	ug/L	50	39.5	79	59-125	
Anthracene	ug/L	50	40.2	80	64-125	
Benzo(a)pyrene	ug/L	50	39.4	79	63-125	
Benzoic acid	ug/L	50	35J	70	30-125	
bis(2-Chloroethyl) ether	ug/L	50	37.3	75	49-125	
bis(2-Ethylhexyl)phthalate	ug/L	50	38.7	77	68-125	
Butylbenzylphthalate	ug/L	50	37.7	75	67-125	
Di-n-butylphthalate	ug/L	50	38.9	78	67-125	
Di-n-octylphthalate	ug/L	50	39.2	78	67-125	
Diethylphthalate	ug/L	50	40.4	81	64-125	
Dimethylphthalate	ug/L	50	38.1	76	65-125	
Fluoranthene	ug/L	50	38.9	78	64-125	
Fluorene	ug/L	50	40.3	81	63-125	
Hexachlorobenzene	ug/L	50	38.4	77	61-125	
Hexachlorocyclopentadiene	ug/L	50	ND	17	30-125	1M,L2
Hexachloroethane	ug/L	50	28.1	56	30-125	
Isophorone	ug/L	50	42.4	85	59-125	
N-Nitrosodimethylamine	ug/L	50	34.8	70	43-125	
Pentachlorophenol	ug/L	50	28.0	56	35-125	
Phenanthrene	ug/L	50	40.7	81	65-125	
Phenol	ug/L	50	37.2	74	54-125	
Pyrene	ug/L	50	37.0	74	65-125	
2,4,6-Tribromophenol (S)	%			74	52-125	
2-Fluorobiphenyl (S)	%			70	52-125	
2-Fluorophenol (S)	%			68	30-125	
Nitrobenzene-d5 (S)	%			77	55-125	
p-Terphenyl-d14 (S)	%			70	57-125	
Phenol-d6 (S)	%			69	30-125	

LABORATORY CONTROL SAMPLE: 3291972

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	38.5	77	60-125	
2,4-Dichlorophenol	ug/L	50	39.9	80	56-125	
2,4-Dimethylphenol	ug/L	50	31.8	64	33-125	
2,4-Dinitrophenol	ug/L	50	17.5	35	32-125	
2-Chlorophenol	ug/L	50	38.2	76	52-125	
2-Methylnaphthalene	ug/L	50	38.4	77	52-125	
2-Methylphenol(o-Cresol)	ug/L	50	38.8	78	55-125	
3&4-Methylphenol(m&p Cresol)	ug/L	50	40.3	81	57-125	
3,3'-Dichlorobenzidine	ug/L	50	39.4J	79	39-150	
4-Bromophenylphenyl ether	ug/L	50	41.1	82	61-125	
Acenaphthene	ug/L	50	41.2	82	59-125	
Anthracene	ug/L	50	43.4	87	64-125	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

LABORATORY CONTROL SAMPLE: 3291972

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzo(a)pyrene	ug/L	50	42.5	85	63-125	
Benzoic acid	ug/L	50	35.8J	72	30-125	
bis(2-Chloroethyl) ether	ug/L	50	38.1	76	49-125	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.3	83	68-125	
Butylbenzylphthalate	ug/L	50	40.7	81	67-125	
Di-n-butylphthalate	ug/L	50	43.4	87	67-125	
Di-n-octylphthalate	ug/L	50	41.7	83	67-125	
Diethylphthalate	ug/L	50	43.7	87	64-125	
Dimethylphthalate	ug/L	50	41.2	82	65-125	
Fluoranthene	ug/L	50	41.2	82	64-125	
Fluorene	ug/L	50	42.8	86	63-125	
Hexachlorobenzene	ug/L	50	40.2	80	61-125	
Hexachlorocyclopentadiene	ug/L	50	ND	18	30-125	1M,L2
Hexachloroethane	ug/L	50	29.0	58	30-125	
Isophorone	ug/L	50	41.5	83	59-125	
N-Nitrosodimethylamine	ug/L	50	35.5	71	43-125	
Pentachlorophenol	ug/L	50	30.8	62	35-125	
Phenanthrene	ug/L	50	42.6	85	65-125	
Phenol	ug/L	50	37.7	75	54-125	
Pyrene	ug/L	50	40.3	81	65-125	
2,4,6-Tribromophenol (S)	%			82	52-125	
2-Fluorobiphenyl (S)	%			73	52-125	
2-Fluorophenol (S)	%			68	30-125	
Nitrobenzene-d5 (S)	%			73	55-125	
p-Terphenyl-d14 (S)	%			74	57-125	
Phenol-d6 (S)	%			70	30-125	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476684

QC Batch: 612265 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10476684001, 10476684002, 10476684003

METHOD BLANK: 3308328 Matrix: Water
Associated Lab Samples: 10476684001, 10476684002, 10476684003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	06/12/19 15:38	

LABORATORY CONTROL SAMPLE: 3308329

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.1	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3308330 3308331

Parameter	Units	10476684001		3308331		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Chloride	mg/L	57.2	12.5	58.8	12.5	12	13	90-110	0	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3308332 3308333

Parameter	Units	10476684002		3308333		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Chloride	mg/L	75.6	62.5	124	62.5	78	78	90-110	0	20	M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

QC Batch: 608961 Analysis Method: SM 3500-Cr B Modified
 QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
 Associated Lab Samples: 10476684001, 10476684002, 10476684003

METHOD BLANK: 3291289 Matrix: Water

Associated Lab Samples: 10476684001, 10476684002, 10476684003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	05/29/19 09:19	

LABORATORY CONTROL SAMPLE: 3291290

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3291291 3291292

Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		10476631001 Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chromium, Hexavalent	mg/L	0.16	0.2	0.2	0.35	0.35	96	97	85-115	0	20		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

QC Batch: 167365

Analysis Method: EPA 350.1 rev. 2 (1993)

QC Batch Method: EPA 350.1 rev. 2 (1993)

Analysis Description: 350.1 Ammonia Distilled

Associated Lab Samples: 10476684001, 10476684002, 10476684003

METHOD BLANK: 659289

Matrix: Water

Associated Lab Samples: 10476684001, 10476684002, 10476684003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	06/04/19 11:12	

LABORATORY CONTROL SAMPLE: 659290

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 659291 659292

Parameter	Units	659291		659292		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10476684001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Nitrogen, Ammonia	mg/L	1.5	5	5	6.3	6.4	96	98	90-110	1	10		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10476684

QC Batch: 610476 Analysis Method: SM 4500-CN-E
QC Batch Method: SM 4500-CN-E Analysis Description: SM4500CN-E Cyanide
Associated Lab Samples: 10476684001, 10476684002

METHOD BLANK: 3298940 Matrix: Water
Associated Lab Samples: 10476684001, 10476684002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	06/05/19 11:47	

LABORATORY CONTROL SAMPLE: 3298941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	257	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3298942 3298943

Parameter	Units	10475971001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	8.7J	250	240	250	220	92	84	80-120	9	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3298944 3298945

Parameter	Units	10476522001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Cyanide	ug/L	17.9J	250	256	250	248	95	92	80-120	3	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

QC Batch: 611928

Analysis Method: SM 4500-CN-E

QC Batch Method: SM 4500-CN-E

Analysis Description: SM4500CN-E Cyanide

Associated Lab Samples: 10476684003

METHOD BLANK: 3306748

Matrix: Water

Associated Lab Samples: 10476684003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	06/11/19 11:46	

LABORATORY CONTROL SAMPLE: 3306749

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	229	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3306750 3306751

Parameter	Units	10477785002		3306751		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Cyanide	ug/L	ND	250	250	25.7	ND	7	0	80-120		30	H3,M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3306752 3306753

Parameter	Units	10477078007		3306753		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Cyanide	ug/L	<20.0	250	250	226	251	89	99	80-120	10	30		

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	0.783 ± 1.27 (2.73) C:NA T:NA	pCi/L	06/06/19 08:17	12587-46-1	
Gross Beta		EPA 900.0	3.13 ± 1.25 (1.82) C:NA T:NA	pCi/L	06/06/19 08:17	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	8.00 ± 4.98 (6.61) C:NA T:NA	pCi/L	06/06/19 08:18	12587-46-1	
Gross Beta		EPA 900.0	10.5 ± 3.94 (5.40) C:NA T:NA	pCi/L	06/06/19 08:18	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	5.88 ± 3.72 (5.76) C:NA T:NA	pCi/L	06/06/19 08:18	12587-46-1	
Gross Beta		EPA 900.0	10.3 ± 3.47 (4.57) C:NA T:NA	pCi/L	06/06/19 08:18	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

QC Batch: 345486

Analysis Method: EPA 900.0

QC Batch Method: EPA 900.0

Analysis Description: 900.0 Gross Alpha/Beta

Associated Lab Samples: 10476684001, 10476684002, 10476684003

METHOD BLANK: 1680781

Matrix: Water

Associated Lab Samples: 10476684001, 10476684002, 10476684003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.055 ± 0.351 (0.895) C:NA T:NA	pCi/L	06/06/19 08:17	
Gross Beta	-0.139 ± 0.454 (1.10) C:NA T:NA	pCi/L	06/06/19 08:17	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.

H3 Sample was received or analysis requested beyond the recognized method holding time.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

S0 Surrogate recovery outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10476684

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10476684001	834657	EPA Mod. 3510C	609269	EPA 8082A	609593
10476684002	834656	EPA Mod. 3510C	609269	EPA 8082A	609593
10476684003	834655	EPA Mod. 3510C	609269	EPA 8082A	609593
10476684001	834657	EPA 200.7	609218	EPA 200.7	610218
10476684002	834656	EPA 200.7	609218	EPA 200.7	610218
10476684003	834655	EPA 200.7	609218	EPA 200.7	610218
10476684001	834657	EPA 200.8	609219	EPA 200.8	610407
10476684002	834656	EPA 200.8	609219	EPA 200.8	610407
10476684003	834655	EPA 200.8	609219	EPA 200.8	610407
10476684001	834657	EPA 3520	609142	EPA 8270D	610147
10476684002	834656	EPA 3520	609142	EPA 8270D	610147
10476684003	834655	EPA 3520	609142	EPA 8270D	610147
10476684001	834657				
10476684002	834656				
10476684003	834655				
10476684001	834657	EPA 900.0	345486		
10476684002	834656	EPA 900.0	345486		
10476684003	834655	EPA 900.0	345486		
10476684001	834657	EPA 300.0	612265		
10476684002	834656	EPA 300.0	612265		
10476684003	834655	EPA 300.0	612265		
10476684001	834657	SM 3500-Cr B Modified	608961		
10476684002	834656	SM 3500-Cr B Modified	608961		
10476684003	834655	SM 3500-Cr B Modified	608961		
10476684001	834657	EPA 350.1			
10476684002	834656	EPA 350.1			
10476684003	834655	EPA 350.1			
10476684001	834657	EPA 350.1 rev. 2 (1993)	167365	EPA 350.1 rev. 2 (1993)	167379
10476684002	834656	EPA 350.1 rev. 2 (1993)	167365	EPA 350.1 rev. 2 (1993)	167379
10476684003	834655	EPA 350.1 rev. 2 (1993)	167365	EPA 350.1 rev. 2 (1993)	167379
10476684001	834657	SM 4500-CN-E	610476	SM 4500-CN-E	610595
10476684002	834656	SM 4500-CN-E	610476	SM 4500-CN-E	610595
10476684003	834655	SM 4500-CN-E	611928	SM 4500-CN-E	612013

REPORT OF LABORATORY ANALYSIS

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WO# 10476684



10476684



Chain-of-Custody For

COC Type:

Page: / of /

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MNSW-057

Program Code (MDH Lab Only):

Lab Name: Pace Analytical - Minneapolis, MN

Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters

Project Task Code: PRJ07786

Address: 1700 SE Elm Street

Project Manager: Brad Jacobson

612-607-6375

EPIC PROFILE #: 38716 Line 2

Minneapolis

MN

55414

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wt-Ground=Groundwater
Wt-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

PRESERV.

None

HNO3

None

H2SO4

NaOH

None

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCr - QAPP Table 3a	Ammonia/Un-ionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SVOC, 8082, MDA1, MDA2 - QAPP Table 3a	Lab Sample No.	#
834657	Sample	5/28/19	1000			G	NW	Wt-Ground	N	CMW-13	14	X	X	X	X	X	X	X		1
834656	Sample	5/28/19	1200			G	NW	Wt-Ground	N	CMW-12	14	X	X	X	X	X	X	X		2
834655	Sample	5/28/19	1400			G	NW	Wt-Ground	N	CMW-11	14	X	X	X	X	X	X	X		3
									N											4
									N											5
									N											6
									N											7
									N											8
									N											9
									N											10

w1
w2
w3

DATA 5/28/19

Sampled By: David Anderson

Sampler's Signature: David Anderson

Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/Affiliation	Date/Time
(Sampler) David Anderson / Pace Analytical	5/28/19 / 1435	Michelle K Pace / Pace Analytical I=6-3, 5.5, 5.00	5/29/19 15:01

Sample Condition Upon Receipt

Client Name:

MPCA

Project #:

WO#: 10476684

PM: JMA

Due Date: 06/11/19

CLIENT: PASI-MNFLD

Courier:

- Fed Ex UPS USPS Client
 Pace Speedee Commercial See Exception

Tracking Number:

Custody Seal on Cooler/Box Present?

Yes No

Seals Intact?

Yes No

Biological Tissue Frozen?

Yes No N/A

Packing Material:

- Bubble Wrap Bubble Bags None Other: PB

Temp Blank?

Yes No

Thermometer:

- T1(0461) T2(1336) T3(0459)
 T4(0254) T5(0489)

Type of Ice:

- Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>0.2, 3.4, 4.9</u> °C	Average Corrected Temp (no temp blank only):	See Exceptions
Correction Factor: <u>+0.1</u>	Cooler Temp Corrected w/temp blank: <u>0.3, 5.5, 5.0</u> °C	°C	<input type="checkbox"/>

USDA Regulated Soil: (N/A, water sample/Other: _____)

Date/Initials of Person Examining Contents: 05/29/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A 3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>FE 5/29/19</u> 4.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 6.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 7.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 9.
Field Filtered Volume Received for Dissolved Tests? ^{JMA} 5/29/19	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A 10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 11. If no, write ID/ Date/Time on Container Below: See Exception <input type="checkbox"/>
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A 12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	<input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate <u>1-3 2/2</u> <u>1-3 2/2</u> <u>1-3 1/1</u>
	Positive for Res. <input type="checkbox"/> Yes See Exception <input type="checkbox"/> Chlorine? <input checked="" type="checkbox"/> No pH Paper Lot# <input type="checkbox"/>
	Res. Chlorine 0-6 Roll 0-6 Strip 0-14 Strip <u>9016</u>
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A 13. See Exception <input type="checkbox"/>
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A 14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased):

CLIENT NOTIFICATION/RESOLUTION

Person Contacted:

Date/Time:

Field Data Required? Yes No

Comments/Resolution:

Project Manager Review:

J. Anderson

Date:

05/29/2019

Note: Whenever there is a discrepancy affecting North Carolina Compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by:

FE



Sample Condition Upon Receipt

Client Name: Pace MN Project #: _____

WO#: 12125610
PM: CLJ Due Date: 06/18/19
CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____
Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.3 Cooler Temp Corrected °C: 0.6 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6 °C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 5/29/19 DC
RB 5/30/19

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>			
All containers needing acid/base preservation properly preserved?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	13. Note samples needing adjustment:
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):			

CLIENT NOTIFICATION/RESOLUTION
Person Contacted: _____ Date/Time: _____
Comments/Resolution: _____
Field Data Required? Yes No

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N
Project Manager Review: Nikki Jarve Date: 5/30/19
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DLHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN

Cert. Needed: Yes No



Workorder: 10476684

Workorder Name: 19-01567 MPCA Freeway LF 19 WT

Owner Received Date: 5/28/2019

Results Requested By: 6/18/2019

Report To		Subcontract To					Requested Analysis																	
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3 & 4 Greensburg, PA 15601 Phone (724)850-5600					<div style="text-align: center;"> <p>WO# : 30296995</p> <p>30296995</p> </div>																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Gross Alpha/Beta	LAB USE ONLY													
						HNO3	BP	IN																
1	834657	PS	5/28/2019 10:00	10476684001	Water	1						X												001
2	834656	PS	5/28/2019 12:00	10476684002	Water	1						X												002
3	834655	PS	5/28/2019 14:00	10476684003	Water	1						X												003
4																								
5																								
Transfers												Comments												
Released By	Date/Time	Received By	Date/Time																					
<i>[Signature]</i>	5/29/19 11:00	<i>[Signature]</i>	5/30/19 9:25																					
Cooler Temperature on Receipt <i>NA</i> °C		Custody Seal <input checked="" type="radio"/> Y or N		Received on Ice Y or <input checked="" type="radio"/> N		Samples Intact <input checked="" type="radio"/> Y or N																		

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace - MN

Project # # 30296995

Courier: Fed Ex UPS USPS Client Commercial Pace Other

Tracking #: 403801969674

Label MJ
LIMS Login MJ

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>1024281</u>	<u>MJ 5/30/19</u>
Chain of Custody Present:	/				
Chain of Custody Filled Out:	/				
Chain of Custody Relinquished:	/				
Sampler Name & Signature on COC:		/			
Sample Labels match COC:	/				
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	/				
Short Hold Time Analysis (<72hr remaining):		/			
Rush Turn Around Time Requested:		/			
Sufficient Volume:	/				
Correct Containers Used:	/				
-Pace Containers Used:	/				
Containers Intact:	/				
Orthophosphate field filtered			/		
Hex Cr Aqueous sample field filtered			/		
Organic Samples checked for dechlorination:			/		
Filtered volume received for Dissolved tests			/		
All containers have been checked for preservation.	/				
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>PHC 2</u>	
All containers meet method preservation requirements.	/			Initial when completed <u>MJ</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			/		
Trip Blank Present:		/			
Trip Blank Custody Seals Present		/			
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed <u>MJ</u>	Date: <u>5/30/19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

June 18, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 05/30/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2020
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2020
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10476684
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
834657	A192205-01	Water	05/28/2019	05/30/2019
834656	A192205-02	Water	05/28/2019	05/30/2019
834655	A192205-03	Water	05/28/2019	05/30/2019

CASE NARRATIVE

Sample Receipt Information:

3 samples were received on 05/30/2019. Samples were received at 2.2 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Continuing Calibration Verification (CCV):

The LC footnote on samples A192205-01 through A192205-03 states that there was a low CCV recovery for bentazon. The lower control limit is 80% and the lowest recovery was 73.5%.

CCV indicates a potential high bias for 2,4,5-T for samples A192205-01 through A192205-03. The upper control limit is 120% and the highest recovery was 128%. Any detections are footnoted with an HC. For the samples where results were less than the reporting limit no further action is required.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10476684
Project Manager: Jennifer Anderson

834657

Date Sampled

A192205-01 (Water)

05/28/2019 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905286

Acetochlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
EPTC	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Phorate	ND	0.30	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Prometon	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Propazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Simazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Triallate	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 11:51	EPA 8270D	

Surrogate: Atrazine-d5

86.9 % 56.9-123

05/30/2019

05/31/2019 11:51

EPA 8270D

Surrogate: Parathion-d10

95.9 % 23.8-169

05/30/2019

05/31/2019 11:51

EPA 8270D

Surrogate: Triphenyl phosphate

134 % 50.5-178

05/30/2019

05/31/2019 11:51

EPA 8270D

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906158

2,4-D	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	
2,4,5-T	4.0	0.50	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	HC
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	LC
Dicamba	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:13	EPA 8151A	

Surrogate: 2,4-D-d5

74.4 %

43.1-133

06/04/2019

06/12/2019 18:13

EPA 8151A

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10476684
Project Manager: Jennifer Anderson

834656

A192205-02 (Water)

Date Sampled

05/28/2019 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905286

Acetochlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
EPTC	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Phorate	ND	0.30	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Prometon	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Propazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Simazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Triallate	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:20	EPA 8270D	
Surrogate: Atrazine-d5		87.9 %	56.9-123		05/30/2019	05/31/2019 12:20	EPA 8270D	
Surrogate: Parathion-d10		93.9 %	23.8-169		05/30/2019	05/31/2019 12:20	EPA 8270D	
Surrogate: Triphenyl phosphate		545 %	50.5-178		05/30/2019	05/31/2019 12:20	EPA 8270D	S

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906158

2,4-D	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	LC
Dicamba	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/04/2019	06/12/2019 18:48	EPA 8151A	
Surrogate: 2,4-D-d5		66.6 %	43.1-133		06/04/2019	06/12/2019 18:48	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10476684
Project Manager: Jennifer Anderson

834655

Date Sampled

A192205-03 (Water)

05/28/2019 14:00

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A905286

Acetochlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
EPTC	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Phorate	ND	0.30	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Prometon	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Propazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Simazine	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Triallate	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	05/30/2019	05/31/2019 12:48	EPA 8270D	
Surrogate: Atrazine-d5		112 %		56.9-123	05/30/2019	05/31/2019 12:48	EPA 8270D	
Surrogate: Parathion-d10		88.7 %		23.8-169	05/30/2019	05/31/2019 12:48	EPA 8270D	
Surrogate: Triphenyl phosphate		133 %		50.5-178	05/30/2019	05/31/2019 12:48	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906158

2,4-D	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	LC
Dicamba	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:24	EPA 8151A	
Surrogate: 2,4-D-d5		76.1 %		43.1-133	06/04/2019	06/12/2019 19:24	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10476684
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A905286 - EPA 3510C

Blank (A905286-BLK1)

Prepared: 05/30/2019 Analyzed: 06/01/2019 16:17

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	0.424		ug/L	0.5250		80.8	56.9-123			
<i>Surrogate: Parathion-d10</i>	0.988		ug/L	0.5445		181	23.8-169			S
<i>Surrogate: Triphenyl phosphate</i>	0.502		ug/L	0.5000		100	50.5-178			

LCS (A905286-BS1)

Prepared: 05/30/2019 Analyzed: 06/01/2019 16:44

Acetochlor	0.996	0.50	ug/L	1.000		99.6	67.8-122			
Alachlor	0.957	0.50	ug/L	1.000		95.7	68.6-119			
Atrazine	0.937	0.50	ug/L	1.000		93.7	68.6-115			
Chlorpyrifos	0.954	0.50	ug/L	1.000		95.4	63.1-120			
Cyanazine	1.11	0.20	ug/L	1.000		111	55.3-143			
Desethylatrazine	1.03	0.50	ug/L	1.000		103	67.8-115			
Deisopropylatrazine	0.864	0.50	ug/L	1.000		86.4	50.1-100			
Dimethenamid	0.951	0.50	ug/L	1.000		95.1	70.3-121			
EPTC	0.780	0.50	ug/L	1.000		78.0	50.4-101			
Ethalfuralin	0.793	0.50	ug/L	1.000		79.3	42.6-121			
Fonofos	0.948	0.50	ug/L	1.000		94.8	56.6-119			
Metolachlor	1.08	0.50	ug/L	1.000		108	71.3-128			
Metribuzin	0.990	0.50	ug/L	1.000		99.0	64.9-120			
Pendimethalin	1.01	0.50	ug/L	1.000		101	60.9-128			
Phorate	0.763	0.30	ug/L	1.000		76.3	37.3-112			
Prometon	1.02	0.50	ug/L	1.000		102	67.1-120			
Propachlor	0.971	0.50	ug/L	1.000		97.1	66.2-127			
Propazine	0.985	0.50	ug/L	1.000		98.5	68.2-118			
Simazine	0.972	0.50	ug/L	1.000		97.2	67.2-117			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10476684
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A905286 - EPA 3510C

LCS (A905286-BS1)

Prepared: 05/30/2019 Analyzed: 06/01/2019 16:44

Terbufos	0.700	0.20	ug/L	1.000		70.0	34.3-111			
Triallate	0.859	0.50	ug/L	1.000		85.9	53-121			
Trifluralin	0.951	0.50	ug/L	1.000		95.1	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.454</i>		<i>ug/L</i>	<i>0.5250</i>		<i>86.5</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.834</i>		<i>ug/L</i>	<i>0.5445</i>		<i>153</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.523</i>		<i>ug/L</i>	<i>0.5000</i>		<i>105</i>	<i>50.5-178</i>			

LCS Dup (A905286-BSD1)

Prepared: 05/30/2019 Analyzed: 06/01/2019 17:12

Acetochlor	0.994	0.50	ug/L	1.000		99.4	67.8-122	0.261	20	
Alachlor	0.958	0.50	ug/L	1.000		95.8	68.6-119	0.131	20	
Atrazine	0.974	0.50	ug/L	1.000		97.4	68.6-115	3.92	20	
Chlorpyrifos	0.935	0.50	ug/L	1.000		93.5	63.1-120	2.07	20	
Cyanazine	1.09	0.20	ug/L	1.000		109	55.3-143	1.94	20	
Desethylatrazine	1.01	0.50	ug/L	1.000		101	67.8-115	2.28	20	
Deisopropylatrazine	0.884	0.50	ug/L	1.000		88.4	50.1-100	2.32	20	
Dimethenamid	0.953	0.50	ug/L	1.000		95.3	70.3-121	0.231	20	
EPTC	0.776	0.50	ug/L	1.000		77.6	50.4-101	0.540	20	
Ethalfuralin	0.977	0.50	ug/L	1.000		97.7	42.6-121	20.8	20	X
Fonofos	1.02	0.50	ug/L	1.000		102	56.6-119	7.31	20	
Metolachlor	1.04	0.50	ug/L	1.000		104	71.3-128	3.49	20	
Metribuzin	0.969	0.50	ug/L	1.000		96.9	64.9-120	2.22	20	
Pendimethalin	0.985	0.50	ug/L	1.000		98.5	60.9-128	2.84	20	
Phorate	0.748	0.30	ug/L	1.000		74.8	37.3-112	1.95	20	
Prometon	1.01	0.50	ug/L	1.000		101	67.1-120	0.518	20	
Propachlor	1.10	0.50	ug/L	1.000		110	66.2-127	12.6	20	
Propazine	0.928	0.50	ug/L	1.000		92.8	68.2-118	6.02	20	
Simazine	0.969	0.50	ug/L	1.000		96.9	67.2-117	0.402	20	
Terbufos	0.725	0.20	ug/L	1.000		72.5	34.3-111	3.45	20	
Triallate	0.928	0.50	ug/L	1.000		92.8	53-121	7.74	20	
Trifluralin	0.910	0.50	ug/L	1.000		91.0	45.9-116	4.45	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.443</i>		<i>ug/L</i>	<i>0.5250</i>		<i>84.3</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.934</i>		<i>ug/L</i>	<i>0.5445</i>		<i>172</i>	<i>23.8-169</i>			S
<i>Surrogate: Triphenyl phosphate</i>	<i>0.512</i>		<i>ug/L</i>	<i>0.5000</i>		<i>102</i>	<i>50.5-178</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10476684
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A906158 - EPA 3510C

Blank (A906158-BLK1)

Prepared: 06/04/2019 Analyzed: 06/12/2019 17:38

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
Surrogate: 2,4-D-d5	1.36		ug/L	2.006		68.0	43.1-133			

LCS (A906158-BS1)

Prepared: 06/04/2019 Analyzed: 06/12/2019 21:44

2,4-D	1.53	0.50	ug/L	2.000		76.7	51.7-152			
2,4-DB	1.65	0.50	ug/L	2.000		82.5	51.5-146			
2,4,5-T	1.57	0.50	ug/L	2.000		78.6	55.4-138			
2,4,5-TP (Silvex)	1.50	0.50	ug/L	2.000		75.1	47.2-152			
Bentazon	0.819	0.50	ug/L	1.000		81.9	48.9-146			
Dicamba	1.50	0.50	ug/L	2.000		75.0	41-149			
MCPA	1.46	0.30	ug/L	2.000		73.2	32.6-148			
Picloram	0.609	0.50	ug/L	1.000		60.9	37.8-121			
Triclopyr	1.54	0.50	ug/L	2.000		76.9	49.9-149			
Surrogate: 2,4-D-d5	1.39		ug/L	2.006		69.3	43.1-133			

LCS Dup (A906158-BSD1)

Prepared: 06/04/2019 Analyzed: 06/12/2019 22:19

2,4-D	1.62	0.50	ug/L	2.000		81.2	51.7-152	5.73	20	
2,4-DB	1.70	0.50	ug/L	2.000		85.1	51.5-146	3.09	20	
2,4,5-T	1.56	0.50	ug/L	2.000		77.8	55.4-138	1.03	20	
2,4,5-TP (Silvex)	1.60	0.50	ug/L	2.000		79.8	47.2-152	6.06	20	
Bentazon	0.825	0.50	ug/L	1.000		82.5	48.9-146	0.791	20	
Dicamba	1.58	0.50	ug/L	2.000		79.0	41-149	5.25	20	
MCPA	1.45	0.30	ug/L	2.000		72.3	32.6-148	1.20	20	
Picloram	0.509	0.50	ug/L	1.000		50.9	37.8-121	17.9	20	
Triclopyr	1.52	0.50	ug/L	2.000		76.1	49.9-149	1.10	20	
Surrogate: 2,4-D-d5	1.35		ug/L	2.006		67.3	43.1-133			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10476684
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- HC Results may be biased high because of high continuing calibration verification (CCV).
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference



31-May-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10476684**

Work Order: **19052029**

Dear Jennifer,

ALS Environmental received 3 samples on 30-May-2019 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 9.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental ALS

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10476684
Work Order: 19052029

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
19052029-01	834657	Water		5/28/2019 10:00	5/30/2019 09:30	<input type="checkbox"/>
19052029-02	834656	Water		5/28/2019 12:00	5/30/2019 09:30	<input type="checkbox"/>
19052029-03	834655	Water		5/28/2019 14:00	5/30/2019 09:30	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10476684
WorkOrder: 19052029

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 31-May-19

Client: Pace Analytical Services, LLC

Project: 10476684

Work Order: 19052029

Sample ID: 834657

Lab ID: 19052029-01

Collection Date: 5/28/2019 10:00 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	5/31/2019 02:42 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 31-May-19

Client: Pace Analytical Services, LLC

Project: 10476684

Work Order: 19052029

Sample ID: 834656

Lab ID: 19052029-02

Collection Date: 5/28/2019 12:00 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	5/31/2019 02:42 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 31-May-19

Client: Pace Analytical Services, LLC

Project: 10476684

Work Order: 19052029

Sample ID: 834655

Lab ID: 19052029-03

Collection Date: 5/28/2019 02:00 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	5/31/2019 02:42 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 19052029
Project: 10476684

QC BATCH REPORT

Batch ID: **R261706** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R261706-R261706				Units: µg/L		Analysis Date: 5/31/2019 02:42 PM		
Client ID:		Run ID: WETCHEM_190531V		SeqNo: 5689080		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	ND	20								

LCS		Sample ID: LCS-R261706-R261706				Units: µg/L		Analysis Date: 5/31/2019 02:42 PM		
Client ID:		Run ID: WETCHEM_190531V		SeqNo: 5689081		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	274.4	20	250	0	110	81-119	0			

MS		Sample ID: 19051781-01A MS				Units: µg/L		Analysis Date: 5/31/2019 02:42 PM		
Client ID:		Run ID: WETCHEM_190531V		SeqNo: 5689087		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	235.5	20	250	-6.08	96.6	81-119	0			

MSD		Sample ID: 19051781-01A MSD				Units: µg/L		Analysis Date: 5/31/2019 02:42 PM		
Client ID:		Run ID: WETCHEM_190531V		SeqNo: 5689088		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	239.6	20	250	-6.08	98.3	81-119	235.5	1.71	20	

The following samples were analyzed in this batch:

19052029-01A	19052029-02A	19052029-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **30-May-19 09:30**

Work Order: **19052029**

Received by: **DS**

Checklist completed by Diane Shaw 30-May-19
eSignature Date

Reviewed by: Chad Whilton 30-May-19
eSignature Date

Matrices: Water

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No
- Sample(s) received on ice? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

June 19, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-02057 MPCAKraemersMineSpr19
Pace Project No.: 10476817

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on May 29, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CERTIFICATIONS

Project: 19-02057 MPCAKraemersMineSpr19
Pace Project No.: 10476817

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
Alaska Certification UST-107
Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683

Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-02057 MPCAKraemersMineSpr19
Pace Project No.: 10476817

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10476817001	Seep 01	Water	05/29/19 09:40	05/29/19 14:00
10476817002	Discharge 01	Water	05/29/19 10:30	05/29/19 14:00
10476817003	Duplicate	Water	05/29/19 10:40	05/29/19 14:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10476817001	Seep 01	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10476817002	Discharge 01	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	2	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10476817003	Duplicate	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RJS	12	PASI-M
		EPA 8270D	STB	38	PASI-M
		EPA 900.0	NEG	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-02057 MPCAKraemersMineSpr19

Sample Project No.: 10476817

Sample: Seep 01		Lab ID: 10476817001	Collected: 05/29/19 09:40	Received: 05/29/19 14:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	05/30/19 09:04	05/31/19 23:51	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	35	%	30-125	1	05/30/19 09:04	05/31/19 23:51	877-09-8	
Decachlorobiphenyl (S)	55	%	30-125	1	05/30/19 09:04	05/31/19 23:51	2051-24-3	
200.7 MET ICP		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum	ND	ug/L	200	1	06/03/19 07:00	06/04/19 08:50	7429-90-5	
Barium	522	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:50	7440-39-3	
Copper	ND	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:50	7440-50-8	
Manganese	744	ug/L	5.0	1	06/03/19 07:00	06/04/19 08:50	7439-96-5	
Nickel	ND	ug/L	20.0	1	06/03/19 07:00	06/04/19 08:50	7440-02-0	
Silver	ND	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:50	7440-22-4	
Tin	ND	ug/L	75.0	1	06/03/19 07:00	06/04/19 08:50	7440-31-5	
Total Hardness by 2340B	370000	ug/L	3300	1	06/03/19 07:00	06/04/19 08:50		
Zinc	ND	ug/L	20.0	1	06/03/19 07:00	06/04/19 08:50	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony	ND	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:34	7440-36-0	
Arsenic	ND	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:34	7440-38-2	
Beryllium	ND	ug/L	0.20	1	06/03/19 06:08	06/07/19 19:34	7440-41-7	
Boron	291	ug/L	10.0	1	06/03/19 06:08	06/07/19 19:34	7440-42-8	
Cadmium	ND	ug/L	0.080	1	06/03/19 06:08	06/07/19 19:34	7440-43-9	
Chromium	0.51	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:34	7440-47-3	
Cobalt	1.6	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:34	7440-48-4	
Lead	ND	ug/L	0.10	1	06/03/19 06:08	06/07/19 19:34	7439-92-1	
Selenium	0.70	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:34	7782-49-2	
Thallium	1.1	ug/L	0.10	1	06/03/19 06:08	06/07/19 19:34	7440-28-0	
Uranium	1.8	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:34	7440-61-1	
Vanadium	ND	ug/L	1.0	1	06/03/19 06:08	06/07/19 19:34	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	83-32-9	
Anthracene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	50-32-8	
Benzoic acid	ND	ug/L	50.5	1	05/29/19 17:40	06/04/19 15:25	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Sample: Seep 01		Lab ID: 10476817001	Collected: 05/29/19 09:40	Received: 05/29/19 14:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
2-Chlorophenol	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	50.5	1	05/29/19 17:40	06/04/19 15:25	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	120-83-2	
Diethylphthalate	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	105-67-9	
Dimethylphthalate	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	117-81-7	
Fluoranthene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	206-44-0	
Fluorene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	86-73-7	
Hexachlorobenzene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	50.5	1	05/29/19 17:40	06/04/19 15:25	77-47-4	L2
Hexachloroethane	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	67-72-1	
Isophorone	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25		
N-Nitrosodimethylamine	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	62-75-9	
Pentachlorophenol	ND	ug/L	20.2	1	05/29/19 17:40	06/04/19 15:25	87-86-5	
Phenanthrene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	85-01-8	
Phenol	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	108-95-2	
Pyrene	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.1	1	05/29/19 17:40	06/04/19 15:25	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	76	%.	55-125	1	05/29/19 17:40	06/04/19 15:25	4165-60-0	
2-Fluorobiphenyl (S)	56	%.	52-125	1	05/29/19 17:40	06/04/19 15:25	321-60-8	
p-Terphenyl-d14 (S)	74	%.	57-125	1	05/29/19 17:40	06/04/19 15:25	1718-51-0	
Phenol-d6 (S)	71	%.	30-125	1	05/29/19 17:40	06/04/19 15:25	13127-88-3	
2-Fluorophenol (S)	68	%.	30-125	1	05/29/19 17:40	06/04/19 15:25	367-12-4	
2,4,6-Tribromophenol (S)	86	%.	52-125	1	05/29/19 17:40	06/04/19 15:25	118-79-6	
Field Data		Analytical Method:						
Field pH	6.6	Std. Units		1		05/29/19 09:40		
Field Temperature	12.5	deg C		1		05/29/19 09:40		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	124	mg/L	6.0	5		06/15/19 14:53	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		05/29/19 17:53		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/19/19 14:42		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Sample: Seep 01		Lab ID: 10476817001	Collected: 05/29/19 09:40	Received: 05/29/19 14:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	6.9	mg/L	0.11	1	06/04/19 08:44	06/04/19 11:20	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	06/11/19 09:01	06/11/19 12:04	57-12-5	

Sample: Discharge 01		Lab ID: 10476817002	Collected: 05/29/19 10:30	Received: 05/29/19 14:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:06	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	41	%	30-125	1	05/30/19 09:04	06/01/19 00:06	877-09-8	
Decachlorobiphenyl (S)	57	%	30-125	1	05/30/19 09:04	06/01/19 00:06	2051-24-3	

200.7 MET ICP		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Aluminum	317	ug/L	200	1	06/03/19 07:00	06/04/19 08:51	7429-90-5	
Barium	174	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:51	7440-39-3	
Copper	ND	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:51	7440-50-8	
Manganese	66.7	ug/L	5.0	1	06/03/19 07:00	06/04/19 08:51	7439-96-5	
Nickel	ND	ug/L	20.0	1	06/03/19 07:00	06/04/19 08:51	7440-02-0	
Silver	ND	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:51	7440-22-4	
Tin	ND	ug/L	75.0	1	06/03/19 07:00	06/04/19 08:51	7440-31-5	
Total Hardness by 2340B	337000	ug/L	3300	1	06/03/19 07:00	06/04/19 08:51		
Zinc	ND	ug/L	20.0	1	06/03/19 07:00	06/04/19 08:51	7440-66-6	

200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Antimony	ND	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:39	7440-36-0	
Arsenic	0.58	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:39	7440-38-2	
Beryllium	ND	ug/L	0.20	1	06/03/19 06:08	06/07/19 19:39	7440-41-7	
Boron	220	ug/L	10.0	1	06/03/19 06:08	06/07/19 19:39	7440-42-8	
Cadmium	ND	ug/L	0.080	1	06/03/19 06:08	06/07/19 19:39	7440-43-9	
Chromium	ND	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:39	7440-47-3	
Cobalt	ND	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:39	7440-48-4	
Lead	0.51	ug/L	0.10	1	06/03/19 06:08	06/07/19 19:39	7439-92-1	
Selenium	6.5	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:39	7782-49-2	
Thallium	0.20	ug/L	0.10	1	06/03/19 06:08	06/07/19 19:39	7440-28-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Sample: Discharge 01	Lab ID: 10476817002	Collected: 05/29/19 10:30	Received: 05/29/19 14:00	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Uranium	2.7	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:39	7440-61-1	
Vanadium	ND	ug/L	1.0	1	06/03/19 06:08	06/07/19 19:39	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	83-32-9	
Anthracene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	50-32-8	
Benzoic acid	ND	ug/L	49.5	1	05/29/19 17:40	06/04/19 15:53	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	111-44-4	
2-Chlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.5	1	05/29/19 17:40	06/04/19 15:53	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	120-83-2	
Diethylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	105-67-9	
Dimethylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	117-81-7	
Fluoranthene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	206-44-0	
Fluorene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	86-73-7	
Hexachlorobenzene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.5	1	05/29/19 17:40	06/04/19 15:53	77-47-4	L2
Hexachloroethane	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	67-72-1	
Isophorone	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53		
N-Nitrosodimethylamine	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	62-75-9	
Pentachlorophenol	ND	ug/L	19.8	1	05/29/19 17:40	06/04/19 15:53	87-86-5	
Phenanthrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	85-01-8	
Phenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	108-95-2	
Pyrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 15:53	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	68	%	55-125	1	05/29/19 17:40	06/04/19 15:53	4165-60-0	
2-Fluorobiphenyl (S)	56	%	52-125	1	05/29/19 17:40	06/04/19 15:53	321-60-8	
p-Terphenyl-d14 (S)	72	%	57-125	1	05/29/19 17:40	06/04/19 15:53	1718-51-0	
Phenol-d6 (S)	66	%	30-125	1	05/29/19 17:40	06/04/19 15:53	13127-88-3	
2-Fluorophenol (S)	65	%	30-125	1	05/29/19 17:40	06/04/19 15:53	367-12-4	
2,4,6-Tribromophenol (S)	79	%	52-125	1	05/29/19 17:40	06/04/19 15:53	118-79-6	

Field Data

Analytical Method:

Field pH **7.5** Std. Units 1 05/29/19 10:30

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Sample: Discharge 01		Lab ID: 10476817002		Collected: 05/29/19 10:30	Received: 05/29/19 14:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:						
Field Temperature	15.0	deg C		1		05/29/19 10:30		
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	57.9	mg/L	1.2	1		06/15/19 09:09	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		05/29/19 17:53		
350.1 Ammonia, Unionized		Analytical Method: EPA 350.1						
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/19/19 14:42		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	0.23	mg/L	0.11	1	06/04/19 08:44	06/04/19 11:21	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	06/11/19 09:01	06/11/19 12:04	57-12-5	

Sample: Duplicate		Lab ID: 10476817003		Collected: 05/29/19 10:40	Received: 05/29/19 14:00	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	05/30/19 09:04	06/01/19 00:21	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	45	%	30-125	1	05/30/19 09:04	06/01/19 00:21	877-09-8	
Decachlorobiphenyl (S)	80	%	30-125	1	05/30/19 09:04	06/01/19 00:21	2051-24-3	
200.7 MET ICP		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum	320	ug/L	200	1	06/03/19 07:00	06/04/19 08:53	7429-90-5	
Barium	174	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:53	7440-39-3	
Copper	ND	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:53	7440-50-8	
Manganese	67.2	ug/L	5.0	1	06/03/19 07:00	06/04/19 08:53	7439-96-5	
Nickel	ND	ug/L	20.0	1	06/03/19 07:00	06/04/19 08:53	7440-02-0	
Silver	ND	ug/L	10.0	1	06/03/19 07:00	06/04/19 08:53	7440-22-4	
Tin	ND	ug/L	75.0	1	06/03/19 07:00	06/04/19 08:53	7440-31-5	
Total Hardness by 2340B	339000	ug/L	3300	1	06/03/19 07:00	06/04/19 08:53		
Zinc	ND	ug/L	20.0	1	06/03/19 07:00	06/04/19 08:53	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Sample: Duplicate		Lab ID: 10476817003	Collected: 05/29/19 10:40	Received: 05/29/19 14:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony	ND	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:43	7440-36-0	
Arsenic	0.58	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:43	7440-38-2	
Beryllium	ND	ug/L	0.20	1	06/03/19 06:08	06/07/19 19:43	7440-41-7	
Boron	218	ug/L	10.0	1	06/03/19 06:08	06/07/19 19:43	7440-42-8	
Cadmium	ND	ug/L	0.080	1	06/03/19 06:08	06/07/19 19:43	7440-43-9	
Chromium	ND	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:43	7440-47-3	
Cobalt	ND	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:43	7440-48-4	
Lead	0.55	ug/L	0.10	1	06/03/19 06:08	06/07/19 19:43	7439-92-1	
Selenium	6.3	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:43	7782-49-2	
Thallium	0.20	ug/L	0.10	1	06/03/19 06:08	06/07/19 19:43	7440-28-0	
Uranium	2.7	ug/L	0.50	1	06/03/19 06:08	06/07/19 19:43	7440-61-1	
Vanadium	ND	ug/L	1.0	1	06/03/19 06:08	06/07/19 19:43	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	83-32-9	
Anthracene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	50-32-8	
Benzoic acid	ND	ug/L	49.5	1	05/29/19 17:40	06/04/19 16:20	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	111-44-4	
2-Chlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.5	1	05/29/19 17:40	06/04/19 16:20	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	120-83-2	
Diethylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	105-67-9	
Dimethylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	117-81-7	
Fluoranthene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	206-44-0	
Fluorene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	86-73-7	
Hexachlorobenzene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.5	1	05/29/19 17:40	06/04/19 16:20	77-47-4	L2
Hexachloroethane	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	67-72-1	
Isophorone	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20		
N-Nitrosodimethylamine	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	62-75-9	
Pentachlorophenol	ND	ug/L	19.8	1	05/29/19 17:40	06/04/19 16:20	87-86-5	
Phenanthrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	85-01-8	
Phenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	108-95-2	
Pyrene	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.9	1	05/29/19 17:40	06/04/19 16:20	88-06-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Sample: Duplicate	Lab ID: 10476817003		Collected: 05/29/19 10:40	Received: 05/29/19 14:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Surrogates								
Nitrobenzene-d5 (S)	68	%.	55-125	1	05/29/19 17:40	06/04/19 16:20	4165-60-0	
2-Fluorobiphenyl (S)	55	%.	52-125	1	05/29/19 17:40	06/04/19 16:20	321-60-8	
p-Terphenyl-d14 (S)	68	%.	57-125	1	05/29/19 17:40	06/04/19 16:20	1718-51-0	
Phenol-d6 (S)	65	%.	30-125	1	05/29/19 17:40	06/04/19 16:20	13127-88-3	
2-Fluorophenol (S)	62	%.	30-125	1	05/29/19 17:40	06/04/19 16:20	367-12-4	
2,4,6-Tribromophenol (S)	75	%.	52-125	1	05/29/19 17:40	06/04/19 16:20	118-79-6	
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	58.2	mg/L	1.2	1		06/15/19 15:44	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		05/29/19 17:53		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	0.23	mg/L	0.11	1	06/04/19 08:44	06/04/19 11:22	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	06/11/19 09:01	06/11/19 12:07	57-12-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

QC Batch: 609530 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 10476817001, 10476817002, 10476817003

METHOD BLANK: 3294149 Matrix: Water

Associated Lab Samples: 10476817001, 10476817002, 10476817003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	200	06/04/19 08:20	
Barium	ug/L	ND	10.0	06/04/19 08:20	
Copper	ug/L	ND	10.0	06/04/19 08:20	
Manganese	ug/L	ND	5.0	06/04/19 08:20	
Nickel	ug/L	ND	20.0	06/04/19 08:20	
Silver	ug/L	ND	10.0	06/04/19 08:20	
Tin	ug/L	ND	75.0	06/04/19 08:20	
Zinc	ug/L	ND	20.0	06/04/19 08:20	

LABORATORY CONTROL SAMPLE: 3294150

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	20000	21000	105	85-115	
Barium	ug/L	1000	1000	100	85-115	
Copper	ug/L	1000	964	96	85-115	
Manganese	ug/L	1000	1010	101	85-115	
Nickel	ug/L	1000	992	99	85-115	
Silver	ug/L	500	496	99	85-115	
Tin	ug/L	1000	1000	100	85-115	
Zinc	ug/L	1000	1010	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3294151 3294152

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10476981001 Result	Spike Conc.	Spike Conc.	Result						
Aluminum	ug/L	53.9J	20000	20000	22100	21800	110	109	70-130	1	20
Barium	ug/L	99.4	1000	1000	1120	1110	102	101	70-130	1	20
Copper	ug/L	25.4	1000	1000	1060	1040	104	102	70-130	2	20
Manganese	ug/L	137	1000	1000	1180	1160	104	102	70-130	2	20
Nickel	ug/L	12.7J	1000	1000	1020	1010	101	99	70-130	1	20
Silver	ug/L	<0.40	500	500	526	523	105	105	70-130	1	20
Tin	ug/L	<3.2	1000	1000	1000	998	100	100	70-130	1	20
Zinc	ug/L	181	1000	1000	1190	1180	101	100	70-130	1	20

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

MATRIX SPIKE SAMPLE:		3294153					
Parameter	Units	10477066001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	1870	20000	24800	114	70-130	
Barium	ug/L	81.2	1000	1090	101	70-130	
Copper	ug/L	ND	1000	1070	106	70-130	
Manganese	ug/L	361	1000	1390	103	70-130	
Nickel	ug/L	ND	1000	999	99	70-130	
Silver	ug/L	ND	500	540	108	70-130	
Tin	ug/L	ND	1000	991	99	70-130	
Zinc	ug/L	43.8	1000	1030	99	70-130	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

QC Batch: 609528 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10476817001, 10476817002, 10476817003

METHOD BLANK: 3294141 Matrix: Water
Associated Lab Samples: 10476817001, 10476817002, 10476817003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	0.50	06/07/19 19:20	
Arsenic	ug/L	ND	0.50	06/07/19 19:20	
Beryllium	ug/L	ND	0.20	06/07/19 19:20	
Boron	ug/L	ND	10.0	06/07/19 19:20	
Cadmium	ug/L	ND	0.080	06/07/19 19:20	
Chromium	ug/L	ND	0.50	06/07/19 19:20	
Cobalt	ug/L	ND	0.50	06/07/19 19:20	
Lead	ug/L	ND	0.10	06/07/19 19:20	
Selenium	ug/L	ND	0.50	06/07/19 19:20	
Thallium	ug/L	ND	0.10	06/07/19 19:20	
Uranium	ug/L	ND	0.50	06/07/19 19:20	
Vanadium	ug/L	ND	1.0	06/07/19 19:20	

LABORATORY CONTROL SAMPLE: 3294142

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	100	93.4	93	85-115	
Arsenic	ug/L	100	95.5	96	85-115	
Beryllium	ug/L	100	101	101	85-115	
Boron	ug/L	100	90.8	91	85-115	
Cadmium	ug/L	100	98.5	98	85-115	
Chromium	ug/L	100	98.6	99	85-115	
Cobalt	ug/L	100	97.3	97	85-115	
Lead	ug/L	100	99.8	100	85-115	
Selenium	ug/L	100	99.7	100	85-115	
Thallium	ug/L	100	96.2	96	85-115	
Uranium	ug/L	100	97.8	98	85-115	
Vanadium	ug/L	100	97.4	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3294143 3294144

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10476784001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony	ug/L	ND	100	100	96.2	96.6	96	96	70-130	0	20	
Arsenic	ug/L	ND	100	100	98.9	90.7	98	90	70-130	9	20	
Beryllium	ug/L	ND	100	100	102	93.4	102	93	70-130	9	20	
Boron	ug/L	25.7	100	100	116	105	90	80	70-130	9	20	
Cadmium	ug/L	ND	100	100	99.4	91.5	99	91	70-130	8	20	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Parameter	Units	3294143		3294144		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10476784001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Chromium	ug/L	ND	100	100	101	92.0	100	92	70-130	9	20	
Cobalt	ug/L	ND	100	100	99.7	91.0	100	91	70-130	9	20	
Lead	ug/L	4.6	100	100	106	97.3	101	93	70-130	8	20	
Selenium	ug/L	ND	100	100	100	92.6	100	93	70-130	8	20	
Thallium	ug/L	ND	100	100	98.0	90.4	98	90	70-130	8	20	
Uranium	ug/L	ND	100	100	102	93.4	101	93	70-130	8	20	
Vanadium	ug/L	ND	100	100	100	92.2	100	92	70-130	8	20	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

QC Batch: 609269 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10476817001, 10476817002, 10476817003

METHOD BLANK: 3292705 Matrix: Water

Associated Lab Samples: 10476817001, 10476817002, 10476817003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	05/31/19 21:34	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	05/31/19 21:34	
Decachlorobiphenyl (S)	%	81	30-125	05/31/19 21:34	
Tetrachloro-m-xylene (S)	%	66	30-125	05/31/19 21:34	

LABORATORY CONTROL SAMPLE: 3292706

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	2	2.0	98	45-125	
PCB-1260 (Aroclor 1260)	ug/L	2	2.2	109	49-125	
Decachlorobiphenyl (S)	%			96	30-125	
Tetrachloro-m-xylene (S)	%			70	30-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3292707 3292708

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10476522001 Result	Spike Conc.	Spike Conc.	Result							Result
PCB-1016 (Aroclor 1016)	ug/L	<0.099	2	2	1.3	1.2	65	61	30-150	7	30	
PCB-1260 (Aroclor 1260)	ug/L	<0.099	2	2	1.7	1.5	84	73	30-150	15	30	
Decachlorobiphenyl (S)	%						70	55	30-125			
Tetrachloro-m-xylene (S)	%						41	40	30-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19
Pace Project No.: 10476817

QC Batch: 609142 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10476817001, 10476817002, 10476817003

METHOD BLANK: 3291948 Matrix: Water
Associated Lab Samples: 10476817001, 10476817002, 10476817003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	06/04/19 10:55	
2,4-Dichlorophenol	ug/L	ND	10.0	06/04/19 10:55	
2,4-Dimethylphenol	ug/L	ND	10.0	06/04/19 10:55	
2,4-Dinitrophenol	ug/L	ND	10.0	06/04/19 10:55	
2-Chlorophenol	ug/L	ND	10.0	06/04/19 10:55	
2-Methylnaphthalene	ug/L	ND	10.0	06/04/19 10:55	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	06/04/19 10:55	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	10.0	06/04/19 10:55	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	06/04/19 10:55	
4-Bromophenylphenyl ether	ug/L	ND	10.0	06/04/19 10:55	
Acenaphthene	ug/L	ND	10.0	06/04/19 10:55	
Anthracene	ug/L	ND	10.0	06/04/19 10:55	
Benzo(a)pyrene	ug/L	ND	10.0	06/04/19 10:55	
Benzoic acid	ug/L	ND	50.0	06/04/19 10:55	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	06/04/19 10:55	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	06/04/19 10:55	
Butylbenzylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Di-n-butylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Di-n-octylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Diethylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Dimethylphthalate	ug/L	ND	10.0	06/04/19 10:55	
Fluoranthene	ug/L	ND	10.0	06/04/19 10:55	
Fluorene	ug/L	ND	10.0	06/04/19 10:55	
Hexachlorobenzene	ug/L	ND	10.0	06/04/19 10:55	
Hexachlorocyclopentadiene	ug/L	ND	50.0	06/04/19 10:55	
Hexachloroethane	ug/L	ND	10.0	06/04/19 10:55	
Isophorone	ug/L	ND	10.0	06/04/19 10:55	
N-Nitrosodimethylamine	ug/L	ND	10.0	06/04/19 10:55	
Pentachlorophenol	ug/L	ND	20.0	06/04/19 10:55	
Phenanthrene	ug/L	ND	10.0	06/04/19 10:55	
Phenol	ug/L	ND	10.0	06/04/19 10:55	
Pyrene	ug/L	ND	10.0	06/04/19 10:55	
2,4,6-Tribromophenol (S)	%	79	52-125	06/04/19 10:55	
2-Fluorobiphenyl (S)	%	73	52-125	06/04/19 10:55	
2-Fluorophenol (S)	%	73	30-125	06/04/19 10:55	
Nitrobenzene-d5 (S)	%	79	55-125	06/04/19 10:55	
p-Terphenyl-d14 (S)	%	76	57-125	06/04/19 10:55	
Phenol-d6 (S)	%	74	30-125	06/04/19 10:55	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

LABORATORY CONTROL SAMPLE & LCSD: 3291949		3291950								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	41.2	40.9	82	82	60-125	1	20	
2,4-Dichlorophenol	ug/L	50	39.6	39.3	79	79	56-125	1	20	
2,4-Dimethylphenol	ug/L	50	38.8	37.4	78	75	33-125	4	20	
2,4-Dinitrophenol	ug/L	50	29.2	26.1	58	52	32-125	11	20	
2-Chlorophenol	ug/L	50	37.4	38.6	75	77	52-125	3	20	
2-Methylnaphthalene	ug/L	50	40.6	39.6	81	79	52-125	2	20	
2-Methylphenol(o-Cresol)	ug/L	50	38.8	39.3	78	79	55-125	1	20	
3&4-Methylphenol(m&p Cresol)	ug/L	50	39.0	39.0	78	78	57-125	0	20	
3,3'-Dichlorobenzidine	ug/L	50	45.3J	39.2J	91	78	39-150		20	
4-Bromophenylphenyl ether	ug/L	50	43.1	38.0	86	76	61-125	13	20	
Acenaphthene	ug/L	50	43.2	40.1	86	80	59-125	7	20	
Anthracene	ug/L	50	45.7	40.9	91	82	64-125	11	20	
Benzo(a)pyrene	ug/L	50	45.1	39.4	90	79	63-125	13	20	
Benzoic acid	ug/L	50	25.7J	ND	51	37	30-125		20	
bis(2-Chloroethyl) ether	ug/L	50	36.5	37.9	73	76	49-125	4	20	
bis(2-Ethylhexyl)phthalate	ug/L	50	44.6	38.7	89	77	68-125	14	20	
Butylbenzylphthalate	ug/L	50	44.3	38.0	89	76	67-125	15	20	
Di-n-butylphthalate	ug/L	50	46.2	40.7	92	81	67-125	13	20	
Di-n-octylphthalate	ug/L	50	44.9	39.4	90	79	67-125	13	20	
Diethylphthalate	ug/L	50	45.1	40.6	90	81	64-125	10	20	
Dimethylphthalate	ug/L	50	44.0	38.8	88	78	65-125	13	20	
Fluoranthene	ug/L	50	45.0	41.6	90	83	64-125	8	20	
Fluorene	ug/L	50	44.8	40.7	90	81	63-125	10	20	
Hexachlorobenzene	ug/L	50	43.5	38.5	87	77	61-125	12	20	
Hexachlorocyclopentadiene	ug/L	50	ND	ND	32	35	30-125		20	1M
Hexachloroethane	ug/L	50	29.5	31.2	59	62	30-125	5	20	
Isophorone	ug/L	50	42.5	40.2	85	80	59-125	6	20	
N-Nitrosodimethylamine	ug/L	50	36.3	36.2	73	72	43-125	0	20	
Pentachlorophenol	ug/L	50	30.7	27.6	61	55	35-125	11	20	
Phenanthrene	ug/L	50	45.2	40.4	90	81	65-125	11	20	
Phenol	ug/L	50	37.9	38.0	76	76	54-125	0	20	
Pyrene	ug/L	50	44.8	38.3	90	77	65-125	16	20	
2,4,6-Tribromophenol (S)	%				83	75	52-125			
2-Fluorobiphenyl (S)	%				78	76	52-125			
2-Fluorophenol (S)	%				67	69	30-125			
Nitrobenzene-d5 (S)	%				73	74	55-125			
p-Terphenyl-d14 (S)	%				80	69	57-125			
Phenol-d6 (S)	%				69	69	30-125			

LABORATORY CONTROL SAMPLE: 3291969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	40.1	80	60-125	
2,4-Dichlorophenol	ug/L	50	39.7	79	56-125	
2,4-Dimethylphenol	ug/L	50	39.0	78	33-125	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

LABORATORY CONTROL SAMPLE: 3291969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dinitrophenol	ug/L	50	16.6	33	32-125	
2-Chlorophenol	ug/L	50	37.3	75	52-125	
2-Methylnaphthalene	ug/L	50	41.5	83	52-125	
2-Methylphenol(o-Cresol)	ug/L	50	38.0	76	55-125	
3&4-Methylphenol(m&p Cresol)	ug/L	50	37.2	74	57-125	
3,3'-Dichlorobenzidine	ug/L	50	41.7J	83	39-150	
4-Bromophenylphenyl ether	ug/L	50	43.9	88	61-125	
Acenaphthene	ug/L	50	42.4	85	59-125	
Anthracene	ug/L	50	43.6	87	64-125	
Benzo(a)pyrene	ug/L	50	42.5	85	63-125	
Benzoic acid	ug/L	50	24.7J	49	30-125	
bis(2-Chloroethyl) ether	ug/L	50	37.0	74	49-125	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.2	82	68-125	
Butylbenzylphthalate	ug/L	50	41.1	82	67-125	
Di-n-butylphthalate	ug/L	50	43.9	88	67-125	
Di-n-octylphthalate	ug/L	50	42.0	84	67-125	
Diethylphthalate	ug/L	50	44.0	88	64-125	
Dimethylphthalate	ug/L	50	42.5	85	65-125	
Fluoranthene	ug/L	50	43.0	86	64-125	
Fluorene	ug/L	50	43.0	86	63-125	
Hexachlorobenzene	ug/L	50	42.4	85	61-125	
Hexachlorocyclopentadiene	ug/L	50	ND	21	30-125	1M, L2
Hexachloroethane	ug/L	50	29.2	58	30-125	
Isophorone	ug/L	50	42.6	85	59-125	
N-Nitrosodimethylamine	ug/L	50	35.0	70	43-125	
Pentachlorophenol	ug/L	50	29.5	59	35-125	
Phenanthrene	ug/L	50	42.3	85	65-125	
Phenol	ug/L	50	37.9	76	54-125	
Pyrene	ug/L	50	41.0	82	65-125	
2,4,6-Tribromophenol (S)	%			80	52-125	
2-Fluorobiphenyl (S)	%			76	52-125	
2-Fluorophenol (S)	%			67	30-125	
Nitrobenzene-d5 (S)	%			74	55-125	
p-Terphenyl-d14 (S)	%			74	57-125	
Phenol-d6 (S)	%			69	30-125	

LABORATORY CONTROL SAMPLE: 3291970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	42.5	85	60-125	
2,4-Dichlorophenol	ug/L	50	40.2	80	56-125	
2,4-Dimethylphenol	ug/L	50	34.0	68	33-125	
2,4-Dinitrophenol	ug/L	50	17.1	34	32-125	
2-Chlorophenol	ug/L	50	37.9	76	52-125	
2-Methylnaphthalene	ug/L	50	40.7	81	52-125	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

LABORATORY CONTROL SAMPLE: 3291970

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Methylphenol(o-Cresol)	ug/L	50	39.0	78	55-125	
3&4-Methylphenol(m&p Cresol)	ug/L	50	40.1	80	57-125	
3,3'-Dichlorobenzidine	ug/L	50	38.5J	77	39-150	
4-Bromophenylphenyl ether	ug/L	50	38.9	78	61-125	
Acenaphthene	ug/L	50	40.4	81	59-125	
Anthracene	ug/L	50	42.3	85	64-125	
Benzo(a)pyrene	ug/L	50	40.5	81	63-125	
Benzoic acid	ug/L	50	34.9J	70	30-125	
bis(2-Chloroethyl) ether	ug/L	50	39.1	78	49-125	
bis(2-Ethylhexyl)phthalate	ug/L	50	40.6	81	68-125	
Butylbenzylphthalate	ug/L	50	39.7	79	67-125	
Di-n-butylphthalate	ug/L	50	43.5	87	67-125	
Di-n-octylphthalate	ug/L	50	41.1	82	67-125	
Diethylphthalate	ug/L	50	41.4	83	64-125	
Dimethylphthalate	ug/L	50	40.6	81	65-125	
Fluoranthene	ug/L	50	43.4	87	64-125	
Fluorene	ug/L	50	41.1	82	63-125	
Hexachlorobenzene	ug/L	50	38.9	78	61-125	
Hexachlorocyclopentadiene	ug/L	50	ND	18	30-125	1M,L2
Hexachloroethane	ug/L	50	30.7	61	30-125	
Isophorone	ug/L	50	40.9	82	59-125	
N-Nitrosodimethylamine	ug/L	50	37.4	75	43-125	
Pentachlorophenol	ug/L	50	29.7	59	35-125	
Phenanthrene	ug/L	50	42.1	84	65-125	
Phenol	ug/L	50	38.0	76	54-125	
Pyrene	ug/L	50	42.2	84	65-125	
2,4,6-Tribromophenol (S)	%			78	52-125	
2-Fluorobiphenyl (S)	%			73	52-125	
2-Fluorophenol (S)	%			68	30-125	
Nitrobenzene-d5 (S)	%			75	55-125	
p-Terphenyl-d14 (S)	%			76	57-125	
Phenol-d6 (S)	%			70	30-125	

LABORATORY CONTROL SAMPLE: 3291971

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	37.5	75	60-125	
2,4-Dichlorophenol	ug/L	50	39.1	78	56-125	
2,4-Dimethylphenol	ug/L	50	30.6	61	33-125	
2,4-Dinitrophenol	ug/L	50	16.6	33	32-125	
2-Chlorophenol	ug/L	50	37.3	75	52-125	
2-Methylnaphthalene	ug/L	50	39.4	79	52-125	
2-Methylphenol(o-Cresol)	ug/L	50	38.1	76	55-125	
3&4-Methylphenol(m&p Cresol)	ug/L	50	38.7	77	57-125	
3,3'-Dichlorobenzidine	ug/L	50	37J	74	39-150	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

LABORATORY CONTROL SAMPLE: 3291971

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4-Bromophenylphenyl ether	ug/L	50	38.5	77	61-125	
Acenaphthene	ug/L	50	39.5	79	59-125	
Anthracene	ug/L	50	40.2	80	64-125	
Benzo(a)pyrene	ug/L	50	39.4	79	63-125	
Benzoic acid	ug/L	50	35J	70	30-125	
bis(2-Chloroethyl) ether	ug/L	50	37.3	75	49-125	
bis(2-Ethylhexyl)phthalate	ug/L	50	38.7	77	68-125	
Butylbenzylphthalate	ug/L	50	37.7	75	67-125	
Di-n-butylphthalate	ug/L	50	38.9	78	67-125	
Di-n-octylphthalate	ug/L	50	39.2	78	67-125	
Diethylphthalate	ug/L	50	40.4	81	64-125	
Dimethylphthalate	ug/L	50	38.1	76	65-125	
Fluoranthene	ug/L	50	38.9	78	64-125	
Fluorene	ug/L	50	40.3	81	63-125	
Hexachlorobenzene	ug/L	50	38.4	77	61-125	
Hexachlorocyclopentadiene	ug/L	50	ND	17	30-125	1M,L2
Hexachloroethane	ug/L	50	28.1	56	30-125	
Isophorone	ug/L	50	42.4	85	59-125	
N-Nitrosodimethylamine	ug/L	50	34.8	70	43-125	
Pentachlorophenol	ug/L	50	28.0	56	35-125	
Phenanthrene	ug/L	50	40.7	81	65-125	
Phenol	ug/L	50	37.2	74	54-125	
Pyrene	ug/L	50	37.0	74	65-125	
2,4,6-Tribromophenol (S)	%			74	52-125	
2-Fluorobiphenyl (S)	%			70	52-125	
2-Fluorophenol (S)	%			68	30-125	
Nitrobenzene-d5 (S)	%			77	55-125	
p-Terphenyl-d14 (S)	%			70	57-125	
Phenol-d6 (S)	%			69	30-125	

LABORATORY CONTROL SAMPLE: 3291972

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	38.5	77	60-125	
2,4-Dichlorophenol	ug/L	50	39.9	80	56-125	
2,4-Dimethylphenol	ug/L	50	31.8	64	33-125	
2,4-Dinitrophenol	ug/L	50	17.5	35	32-125	
2-Chlorophenol	ug/L	50	38.2	76	52-125	
2-Methylnaphthalene	ug/L	50	38.4	77	52-125	
2-Methylphenol(o-Cresol)	ug/L	50	38.8	78	55-125	
3&4-Methylphenol(m&p Cresol)	ug/L	50	40.3	81	57-125	
3,3'-Dichlorobenzidine	ug/L	50	39.4J	79	39-150	
4-Bromophenylphenyl ether	ug/L	50	41.1	82	61-125	
Acenaphthene	ug/L	50	41.2	82	59-125	
Anthracene	ug/L	50	43.4	87	64-125	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

LABORATORY CONTROL SAMPLE: 3291972

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzo(a)pyrene	ug/L	50	42.5	85	63-125	
Benzoic acid	ug/L	50	35.8J	72	30-125	
bis(2-Chloroethyl) ether	ug/L	50	38.1	76	49-125	
bis(2-Ethylhexyl)phthalate	ug/L	50	41.3	83	68-125	
Butylbenzylphthalate	ug/L	50	40.7	81	67-125	
Di-n-butylphthalate	ug/L	50	43.4	87	67-125	
Di-n-octylphthalate	ug/L	50	41.7	83	67-125	
Diethylphthalate	ug/L	50	43.7	87	64-125	
Dimethylphthalate	ug/L	50	41.2	82	65-125	
Fluoranthene	ug/L	50	41.2	82	64-125	
Fluorene	ug/L	50	42.8	86	63-125	
Hexachlorobenzene	ug/L	50	40.2	80	61-125	
Hexachlorocyclopentadiene	ug/L	50	ND	18	30-125	1M,L2
Hexachloroethane	ug/L	50	29.0	58	30-125	
Isophorone	ug/L	50	41.5	83	59-125	
N-Nitrosodimethylamine	ug/L	50	35.5	71	43-125	
Pentachlorophenol	ug/L	50	30.8	62	35-125	
Phenanthrene	ug/L	50	42.6	85	65-125	
Phenol	ug/L	50	37.7	75	54-125	
Pyrene	ug/L	50	40.3	81	65-125	
2,4,6-Tribromophenol (S)	%			82	52-125	
2-Fluorobiphenyl (S)	%			73	52-125	
2-Fluorophenol (S)	%			68	30-125	
Nitrobenzene-d5 (S)	%			73	55-125	
p-Terphenyl-d14 (S)	%			74	57-125	
Phenol-d6 (S)	%			70	30-125	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19
Pace Project No.: 10476817

QC Batch: 612880 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 10476817001, 10476817002, 10476817003

METHOD BLANK: 3311544 Matrix: Water
Associated Lab Samples: 10476817001, 10476817002, 10476817003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	06/15/19 01:28	

LABORATORY CONTROL SAMPLE: 3311545

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.2	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3311546 3311547

Parameter	Units	10477492002		MS		MSD		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	26.8	12.5	12.5	12.5	32.5	35.5	46	70	90-110	9	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3311548 3311549

Parameter	Units	10477492003		MS		MSD		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	38.3	12.5	12.5	12.5	45.1	44.0	54	45	90-110	2	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19
Pace Project No.: 10476817

QC Batch: 608961 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10476817001, 10476817002, 10476817003

METHOD BLANK: 3291289 Matrix: Water
Associated Lab Samples: 10476817001, 10476817002, 10476817003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	05/29/19 09:19	

LABORATORY CONTROL SAMPLE: 3291290

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3291291 3291292

Parameter	Units	3291291		3291292		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10476631001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chromium, Hexavalent	mg/L	0.16	0.2	0.2	0.35	0.35	96	97	85-115	0	20	

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19
Pace Project No.: 10476817

QC Batch: 167365 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10476817001, 10476817002, 10476817003

METHOD BLANK: 659289 Matrix: Water
Associated Lab Samples: 10476817001, 10476817002, 10476817003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	06/04/19 11:12	

LABORATORY CONTROL SAMPLE: 659290

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 659291 659292

Parameter	Units	659291		659292		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10476684001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Nitrogen, Ammonia	mg/L	1.5	5	5	6.3	6.4	96	98	90-110	1	10		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

QC Batch: 611928

Analysis Method: SM 4500-CN-E

QC Batch Method: SM 4500-CN-E

Analysis Description: SM4500CN-E Cyanide

Associated Lab Samples: 10476817001, 10476817002, 10476817003

METHOD BLANK: 3306748

Matrix: Water

Associated Lab Samples: 10476817001, 10476817002, 10476817003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	06/11/19 11:46	

LABORATORY CONTROL SAMPLE: 3306749

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	229	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3306750 3306751

Parameter	Units	10477785002 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec							
Cyanide	ug/L	ND	250	25.7	ND	7	0	80-120	30	H3,M1				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3306752 3306753

Parameter	Units	10477078007 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec							
Cyanide	ug/L	<20.0	250	226	251	89	99	80-120	10	30				

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Sample: Seep 01		Lab ID: 10476817001	Collected: 05/29/19 09:40	Received: 05/29/19 14:00	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	1.79 ± 1.27 (2.06)		pCi/L	06/06/19 19:15	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	10.4 ± 2.56 (2.55)		pCi/L	06/06/19 19:15	12587-47-2	
		C:NA T:NA					

Sample: Discharge 01		Lab ID: 10476817002	Collected: 05/29/19 10:30	Received: 05/29/19 14:00	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	4.98 ± 1.75 (1.81)		pCi/L	06/06/19 19:15	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	4.08 ± 1.78 (2.81)		pCi/L	06/06/19 19:15	12587-47-2	
		C:NA T:NA					

Sample: Duplicate		Lab ID: 10476817003	Collected: 05/29/19 10:40	Received: 05/29/19 14:00	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	2.95 ± 3.87 (7.98)		pCi/L	06/07/19 08:03	12587-46-1	
		C:NA T:NA					
Gross Beta	EPA 900.0	8.28 ± 4.88 (8.83)		pCi/L	06/07/19 08:03	12587-47-2	
		C:NA T:NA					

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

QC Batch:	345806	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10476817001, 10476817002, 10476817003		

METHOD BLANK:	1682213	Matrix:	Water
Associated Lab Samples:	10476817001, 10476817002, 10476817003		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.152 ± 0.337 (0.767) C:NA T:NA	pCi/L	06/07/19 08:22	
Gross Beta	-0.185 ± 0.424 (1.04) C:NA T:NA	pCi/L	06/07/19 08:22	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 19-02057 MPCAKraemersMineSpr19
Pace Project No.: 10476817

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
 ND - Not Detected at or above adjusted reporting limit.
 TNTC - Too Numerous To Count
 J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
 MDL - Adjusted Method Detection Limit.
 PQL - Practical Quantitation Limit.
 RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
 S - Surrogate
 1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
 Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
 LCS(D) - Laboratory Control Sample (Duplicate)
 MS(D) - Matrix Spike (Duplicate)
 DUP - Sample Duplicate
 RPD - Relative Percent Difference
 NC - Not Calculable.
 SG - Silica Gel - Clean-Up
 U - Indicates the compound was analyzed for, but not detected.
 N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
 Act - Activity
 Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).
 Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
 (MDC) - Minimum Detectable Concentration
 Trac - Tracer Recovery (%)
 Carr - Carrier Recovery (%)
 Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
 TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis
 PASI-PA Pace Analytical Services - Greensburg
 PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10476817

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

ANALYTE QUALIFIERS

1M The associated compound was outside of 20% for the associated continuing calibration but within 40% of the true value.
 H3 Sample was received or analysis requested beyond the recognized method holding time.
 L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
 M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-02057 MPCAKraemersMineSpr19

Pace Project No.: 10476817

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10476817001	Seep 01	EPA Mod. 3510C	609269	EPA 8082A	609593
10476817002	Discharge 01	EPA Mod. 3510C	609269	EPA 8082A	609593
10476817003	Duplicate	EPA Mod. 3510C	609269	EPA 8082A	609593
10476817001	Seep 01	EPA 200.7	609530	EPA 200.7	610219
10476817002	Discharge 01	EPA 200.7	609530	EPA 200.7	610219
10476817003	Duplicate	EPA 200.7	609530	EPA 200.7	610219
10476817001	Seep 01	EPA 200.8	609528	EPA 200.8	610443
10476817002	Discharge 01	EPA 200.8	609528	EPA 200.8	610443
10476817003	Duplicate	EPA 200.8	609528	EPA 200.8	610443
10476817001	Seep 01	EPA 3520	609142	EPA 8270D	610147
10476817002	Discharge 01	EPA 3520	609142	EPA 8270D	610147
10476817003	Duplicate	EPA 3520	609142	EPA 8270D	610147
10476817001	Seep 01				
10476817002	Discharge 01				
10476817001	Seep 01	EPA 900.0	345806		
10476817002	Discharge 01	EPA 900.0	345806		
10476817003	Duplicate	EPA 900.0	345806		
10476817001	Seep 01	EPA 300.0	612880		
10476817002	Discharge 01	EPA 300.0	612880		
10476817003	Duplicate	EPA 300.0	612880		
10476817001	Seep 01	SM 3500-Cr B Modified	608961		
10476817002	Discharge 01	SM 3500-Cr B Modified	608961		
10476817003	Duplicate	SM 3500-Cr B Modified	608961		
10476817001	Seep 01	EPA 350.1			
10476817002	Discharge 01	EPA 350.1			
10476817001	Seep 01	EPA 350.1 rev. 2 (1993)	167365	EPA 350.1 rev. 2 (1993)	167379
10476817002	Discharge 01	EPA 350.1 rev. 2 (1993)	167365	EPA 350.1 rev. 2 (1993)	167379
10476817003	Duplicate	EPA 350.1 rev. 2 (1993)	167365	EPA 350.1 rev. 2 (1993)	167379
10476817001	Seep 01	SM 4500-CN-E	611928	SM 4500-CN-E	612013
10476817002	Discharge 01	SM 4500-CN-E	611928	SM 4500-CN-E	612013
10476817003	Duplicate	SM 4500-CN-E	611928	SM 4500-CN-E	612013

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

Client Name: MPCA - Kraemers Mine Project #: **WO# : 10476817**
 Courier: Fed Ex UPS USPS Client Pace SpeedDee Commercial See Exception
 Tracking Number: _____

PM: JMA Due Date: 06/12/19
 CLIENT: PASI-MNFLD

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A
 Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No
 Thermometer: T1(0461) T2(1336) T3(0459) T4(0254) T5(0489) Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>0.9, 13.1, 10.7</u> °C	Average Corrected Temp (no temp blank only): <input checked="" type="checkbox"/> See Exceptions
Correction Factor: <u>+0.1</u>	Cooler Temp Corrected w/temp blank: <u>1.0, 13.2, 10.8</u> °C	°C

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/Initials of Person Examining Contents: CG 5/29/19
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	11. If no, write ID/ Date/Time on Container Below: <input type="checkbox"/> See Exception
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>1-3²/₂</u> <input checked="" type="checkbox"/> NaOH <u>1-3²/₂</u> <input checked="" type="checkbox"/> HNO ₃ <u>1-3¹/₁</u> <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> See Exception Chlorine? <input checked="" type="checkbox"/> No pH Paper Lot# <input type="checkbox"/>
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Res. Chlorine 0-6 Roll 0-6 Strip 0-14 Strip <u>9016</u> <u>213316AV</u> <u>10D4671</u>
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> See Exception
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): <u>N/A</u>

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review: [Signature] Date: 05/30/2019
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of note, incorrect preservative, out of temp, incorrect containers).

Labeled by: [Signature]



Sample Condition Upon Receipt

Client Name: Pace MN

Project #:

WO#: 12125685

PM: CLJ

Due Date: 06/19/19

CLIENT: PACE MPLS

Courier: Fed Ex, UPS, USPS, Client, Commercial, Pace, Other

Tracking Number:

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: Proj. Name:

Packing Material: Bubble Wrap, Bubble Bags, None, Other Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet, Blue, None Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.1 Cooler Temp Corrected °C: 1.4 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6 °C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 5/30/19 DC

Table with 16 rows of inspection items and checkboxes. Includes items like Chain of Custody Present, Samples Arrived within Hold Time, and Headspace in Methyl Mercury Container.

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: Date/Time:

Comments/Resolution:

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Nikki Jarve

Date: 5/31/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DLHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace MN

Project # 30297294

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4638 0196 9961

Label	<u>ET</u>
LIMS Login	<u>ET</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature _____ Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
 Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and initials of person examining contents: <u>ET 5-31-19</u>
	Yes	No	N/A	
Chain of Custody Present:	/			1. <u>10D4281</u>
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/			4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	/			5.
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):	/			7.
Rush Turn Around Time Requested:	/			8.
Sufficient Volume:	/			9.
Correct Containers Used: -Pace Containers Used:	/			10.
Containers Intact:	/			11.
Orthophosphate field filtered	/			12.
Hex Cr Aqueous sample field filtered	/			13.
Organic Samples checked for dechlorination:	/			14.
Filtered volume received for Dissolved tests	/			15.
All containers have been checked for preservation.	/			16.
exceptions: VOA, collform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>PHL2</u>
All containers meet method preservation requirements.	/			
				Initial when completed <u>ET</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	/			17.
Trip Blank Present:	/			18.
Trip Blank Custody Seals Present	/			
Rad Samples Screened < 0.5 mrem/hr	/			Initial when completed: <u>ET</u> Date: <u>5-31-19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



14-Jun-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10476817**

Work Order: **19052116**

Dear Jennifer,

ALS Environmental received 3 samples on 31-May-2019 10:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 10.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10476817
Work Order: 19052116

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
19052116-01	Seep 1	Water		5/29/2019 09:40	5/31/2019 10:30	<input type="checkbox"/>
19052116-02	Discharge 01	Water		5/29/2019 10:30	5/31/2019 10:30	<input type="checkbox"/>
19052116-03	Duplicate	Water		5/29/2019 10:40	5/31/2019 10:30	<input type="checkbox"/>

Client: Pace Analytical Services, LLC

Project: 10476817

Work Order: 19052116

Case Narrative

Batch R262499, Method CNF_9014_W, Sample 19052116-01A MSD: The RPD between the MS and MSD was outside the control limit for Free Cyanide. The corresponding result in the parent sample should be considered estimated.

Client: Pace Analytical Services, LLC
Project: 10476817
WorkOrder: 19052116

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 14-Jun-19

Client: Pace Analytical Services, LLC

Project: 10476817

Work Order: 19052116

Sample ID: Seep 1

Lab ID: 19052116-01

Collection Date: 5/29/2019 09:40 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	6/12/2019 02:05 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 14-Jun-19

Client: Pace Analytical Services, LLC
Project: 10476817
Sample ID: Discharge 01
Collection Date: 5/29/2019 10:30 AM

Work Order: 19052116
Lab ID: 19052116-02
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE Cyanide, Free	ND		SW9014 20	µg/L	1	Analyst: RZM 6/12/2019 02:05 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 14-Jun-19

Client: Pace Analytical Services, LLC

Project: 10476817

Work Order: 19052116

Sample ID: Duplicate

Lab ID: 19052116-03

Collection Date: 5/29/2019 10:40 AM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	6/12/2019 02:05 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 19052116
Project: 10476817

QC BATCH REPORT

Batch ID: **R262499** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R262499-R262499				Units: µg/L		Analysis Date: 6/12/2019 02:05 PM		
Client ID:		Run ID: WETCHEM_190612U		SeqNo: 5711012		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free ND 20

LCS		Sample ID: LCS-R262499-R262499				Units: µg/L		Analysis Date: 6/12/2019 02:05 PM		
Client ID:		Run ID: WETCHEM_190612U		SeqNo: 5711013		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 271.2 20 250 0 108 81-119 0

MS		Sample ID: 19052116-01A MS				Units: µg/L		Analysis Date: 6/12/2019 02:05 PM		
Client ID: Seep 1		Run ID: WETCHEM_190612U		SeqNo: 5711015		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 112.1 20 250 -11.2 49.3 81-119 0 S

MSD		Sample ID: 19052116-01A MSD				Units: µg/L		Analysis Date: 6/12/2019 02:05 PM		
Client ID: Seep 1		Run ID: WETCHEM_190612U		SeqNo: 5711016		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Cyanide, Free 77.26 20 250 -11.2 35.4 81-119 112.1 36.8 20 SR

The following samples were analyzed in this batch:

19052116-01A	19052116-02A	19052116-03A
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Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **31-May-19 10:30**

Work Order: **19052116**

Received by: **DS**

Checklist completed by Diane Shaw 31-May-19
eSignature Date

Reviewed by: Chad Whilton 31-May-19
eSignature Date

Matrices: Water

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No
- Sample(s) received on ice? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

June 18, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414
RE: MPCA Kraemers

Enclosed are the analytical results for the samples received by the laboratory on 05/31/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2020
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2020
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Kraemers
Project Number: 10476817
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Seep 01	A192214-01	Water	05/29/2019	05/31/2019
Discharge 01	A192214-02	Water	05/29/2019	05/31/2019
Duplicate	A192214-03	Water	05/29/2019	05/31/2019

CASE NARRATIVE

Sample Receipt Information:

3 samples were received on 05/31/2019. Samples were received at 3.2 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The LCS recovery indicates a potential high bias for ethalfluralin, fonofos, propachlor and triallate for samples A192214-01 through A192214-03. Samples were less than the reporting limit for these analytes so no further action is required.

Continuing Calibration Verification (CCV):

The LC footnote on samples A192214-01 through A192214-03 states that there was a low CCV recovery for bentazon. The lower control limit is 80% and the lowest recovery was 73.5%.

CCV indicates a potential high bias for 2,4,5-T for samples A192214-01 through A192214-03. Samples were less than the reporting limit for this analyte so no further action is required.

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Kraemers
Project Number: 10476817
Project Manager: Jennifer Anderson

Seep 01

A192214-01 (Water)

Date Sampled
05/29/2019 09:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906159

Acetochlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
EPTC	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Phorate	ND	0.30	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Prometon	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Propazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Simazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Triallate	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 03:52	EPA 8270D	
Surrogate: Atrazine-d5		86.4 %		56.9-123	06/04/2019	06/06/2019 03:52	EPA 8270D	
Surrogate: Parathion-d10		95.6 %		23.8-169	06/04/2019	06/06/2019 03:52	EPA 8270D	
Surrogate: Triphenyl phosphate		114 %		50.5-178	06/04/2019	06/06/2019 03:52	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906158

2,4-D	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	LC
Dicamba	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/04/2019	06/12/2019 19:59	EPA 8151A	
Surrogate: 2,4-D-d5		79.9 %		43.1-133	06/04/2019	06/12/2019 19:59	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Kraemers
Project Number: 10476817
Project Manager: Jennifer Anderson

Discharge 01
A192214-02 (Water)

Date Sampled
05/29/2019 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906159

Acetochlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
EPTC	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Phorate	ND	0.30	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Prometon	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Propazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Simazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Triallate	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 04:21	EPA 8270D	
Surrogate: Atrazine-d5		85.4 %		56.9-123	06/04/2019	06/06/2019 04:21	EPA 8270D	
Surrogate: Parathion-d10		113 %		23.8-169	06/04/2019	06/06/2019 04:21	EPA 8270D	
Surrogate: Triphenyl phosphate		105 %		50.5-178	06/04/2019	06/06/2019 04:21	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906158

2,4-D	ND	0.50	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	LC
Dicamba	ND	0.50	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/04/2019	06/12/2019 20:34	EPA 8151A	
Surrogate: 2,4-D-d5		78.8 %		43.1-133	06/04/2019	06/12/2019 20:34	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Kraemers
Project Number: 10476817
Project Manager: Jennifer Anderson

Duplicate

A192214-03 (Water)

Date Sampled
05/29/2019 10:40

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906159

Acetochlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
EPTC	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Phorate	ND	0.30	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Prometon	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Propazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Simazine	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Triallate	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	06/04/2019	06/06/2019 06:43	EPA 8270D	
Surrogate: Atrazine-d5		77.5 %		56.9-123	06/04/2019	06/06/2019 06:43	EPA 8270D	
Surrogate: Parathion-d10		122 %		23.8-169	06/04/2019	06/06/2019 06:43	EPA 8270D	
Surrogate: Triphenyl phosphate		99.4 %		50.5-178	06/04/2019	06/06/2019 06:43	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906158

2,4-D	ND	0.50	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	LC
Dicamba	ND	0.50	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/04/2019	06/12/2019 21:09	EPA 8151A	
Surrogate: 2,4-D-d5		76.0 %		43.1-133	06/04/2019	06/12/2019 21:09	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Kraemers
Project Number: 10476817
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A906159 - EPA 3510C

Blank (A906159-BLK1)

Prepared: 06/04/2019 Analyzed: 06/06/2019 00:05

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	0.450		ug/L	0.5250		85.8	56.9-123			
<i>Surrogate: Parathion-d10</i>	1.09		ug/L	0.5445		200	23.8-169			S
<i>Surrogate: Triphenyl phosphate</i>	0.466		ug/L	0.5000		93.3	50.5-178			

LCS (A906159-BS1)

Prepared: 06/04/2019 Analyzed: 06/06/2019 00:34

Acetochlor	0.861	0.50	ug/L	1.000		86.1	67.8-122			
Alachlor	0.870	0.50	ug/L	1.000		87.0	68.6-119			
Atrazine	0.892	0.50	ug/L	1.000		89.2	68.6-115			
Chlorpyrifos	0.886	0.50	ug/L	1.000		88.6	63.1-120			
Cyanazine	0.922	0.20	ug/L	1.000		92.2	55.3-143			
Desethylatrazine	0.884	0.50	ug/L	1.000		88.4	67.8-115			
Deisopropylatrazine	0.677	0.50	ug/L	1.000		67.7	50.1-100			
Dimethenamid	0.876	0.50	ug/L	1.000		87.6	70.3-121			
EPTC	0.795	0.50	ug/L	1.000		79.5	50.4-101			
Ethalfuralin	1.63	0.50	ug/L	1.000		163	42.6-121			
Fonofos	1.71	0.50	ug/L	1.000		171	56.6-119			
Metolachlor	0.926	0.50	ug/L	1.000		92.6	71.3-128			
Metribuzin	0.833	0.50	ug/L	1.000		83.3	64.9-120			
Pendimethalin	0.845	0.50	ug/L	1.000		84.5	60.9-128			
Phorate	0.697	0.30	ug/L	1.000		69.7	37.3-112			
Prometon	0.864	0.50	ug/L	1.000		86.4	67.1-120			
Propachlor	1.90	0.50	ug/L	1.000		190	66.2-127			
Propazine	0.879	0.50	ug/L	1.000		87.9	68.2-118			
Simazine	0.898	0.50	ug/L	1.000		89.8	67.2-117			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Kraemers
Project Number: 10476817
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A906159 - EPA 3510C

LCS (A906159-BS1)

Prepared: 06/04/2019 Analyzed: 06/06/2019 00:34

Terbufos	0.615	0.20	ug/L	1.000		61.5	34.3-111			
Triallate	1.79	0.50	ug/L	1.000		179	53-121			
Trifluralin	0.786	0.50	ug/L	1.000		78.6	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.426</i>		<i>ug/L</i>	<i>0.5250</i>		<i>81.2</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.896</i>		<i>ug/L</i>	<i>0.5445</i>		<i>165</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.447</i>		<i>ug/L</i>	<i>0.5000</i>		<i>89.5</i>	<i>50.5-178</i>			

LCS Dup (A906159-BS1)

Prepared: 06/04/2019 Analyzed: 06/06/2019 01:02

Acetochlor	0.956	0.50	ug/L	1.000		95.6	67.8-122	10.5	20	
Alachlor	0.961	0.50	ug/L	1.000		96.1	68.6-119	9.91	20	
Atrazine	1.01	0.50	ug/L	1.000		101	68.6-115	12.0	20	
Chlorpyrifos	0.943	0.50	ug/L	1.000		94.3	63.1-120	6.23	20	
Cyanazine	0.983	0.20	ug/L	1.000		98.3	55.3-143	6.39	20	
Desethylatrazine	0.928	0.50	ug/L	1.000		92.8	67.8-115	4.85	20	
Deisopropylatrazine	0.685	0.50	ug/L	1.000		68.5	50.1-100	1.26	20	
Dimethenamid	0.976	0.50	ug/L	1.000		97.6	70.3-121	10.8	20	
EPTC	0.816	0.50	ug/L	1.000		81.6	50.4-101	2.56	20	
Ethalfuralin	1.13	0.50	ug/L	1.000		113	42.6-121	36.6	20	X
Fonofos	1.19	0.50	ug/L	1.000		119	56.6-119	36.0	20	X
Metolachlor	1.00	0.50	ug/L	1.000		100	71.3-128	7.69	20	
Metribuzin	0.925	0.50	ug/L	1.000		92.5	64.9-120	10.4	20	
Pendimethalin	0.881	0.50	ug/L	1.000		88.1	60.9-128	4.13	20	
Phorate	0.751	0.30	ug/L	1.000		75.1	37.3-112	7.50	20	
Prometon	0.949	0.50	ug/L	1.000		94.9	67.1-120	9.37	20	
Propachlor	1.33	0.50	ug/L	1.000		133	66.2-127	35.1	20	X
Propazine	0.979	0.50	ug/L	1.000		97.9	68.2-118	10.7	20	
Simazine	1.01	0.50	ug/L	1.000		101	67.2-117	11.7	20	
Terbufos	0.766	0.20	ug/L	1.000		76.6	34.3-111	21.8	20	X
Triallate	1.14	0.50	ug/L	1.000		114	53-121	44.4	20	X
Trifluralin	0.824	0.50	ug/L	1.000		82.4	45.9-116	4.78	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.474</i>		<i>ug/L</i>	<i>0.5250</i>		<i>90.3</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>0.598</i>		<i>ug/L</i>	<i>0.5445</i>		<i>110</i>	<i>23.8-169</i>			
<i>Surrogate: Triphenyl phosphate</i>	<i>0.487</i>		<i>ug/L</i>	<i>0.5000</i>		<i>97.4</i>	<i>50.5-178</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Kraemers
Project Number: 10476817
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A906158 - EPA 3510C

Blank (A906158-BLK1)

Prepared: 06/04/2019 Analyzed: 06/12/2019 17:38

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
<i>Surrogate: 2,4-D-d5</i>	<i>1.36</i>		<i>ug/L</i>	<i>2.006</i>		<i>68.0</i>	<i>43.1-133</i>			

LCS (A906158-BS1)

Prepared: 06/04/2019 Analyzed: 06/12/2019 21:44

2,4-D	1.53	0.50	ug/L	2.000		76.7	51.7-152			
2,4-DB	1.65	0.50	ug/L	2.000		82.5	51.5-146			
2,4,5-T	1.57	0.50	ug/L	2.000		78.6	55.4-138			
2,4,5-TP (Silvex)	1.50	0.50	ug/L	2.000		75.1	47.2-152			
Bentazon	0.819	0.50	ug/L	1.000		81.9	48.9-146			
Dicamba	1.50	0.50	ug/L	2.000		75.0	41-149			
MCPA	1.46	0.30	ug/L	2.000		73.2	32.6-148			
Picloram	0.609	0.50	ug/L	1.000		60.9	37.8-121			
Triclopyr	1.54	0.50	ug/L	2.000		76.9	49.9-149			
<i>Surrogate: 2,4-D-d5</i>	<i>1.39</i>		<i>ug/L</i>	<i>2.006</i>		<i>69.3</i>	<i>43.1-133</i>			

LCS Dup (A906158-BSD1)

Prepared: 06/04/2019 Analyzed: 06/12/2019 22:19

2,4-D	1.62	0.50	ug/L	2.000		81.2	51.7-152	5.73	20	
2,4-DB	1.70	0.50	ug/L	2.000		85.1	51.5-146	3.09	20	
2,4,5-T	1.56	0.50	ug/L	2.000		77.8	55.4-138	1.03	20	
2,4,5-TP (Silvex)	1.60	0.50	ug/L	2.000		79.8	47.2-152	6.06	20	
Bentazon	0.825	0.50	ug/L	1.000		82.5	48.9-146	0.791	20	
Dicamba	1.58	0.50	ug/L	2.000		79.0	41-149	5.25	20	
MCPA	1.45	0.30	ug/L	2.000		72.3	32.6-148	1.20	20	
Picloram	0.509	0.50	ug/L	1.000		50.9	37.8-121	17.9	20	
Triclopyr	1.52	0.50	ug/L	2.000		76.1	49.9-149	1.10	20	
<i>Surrogate: 2,4-D-d5</i>	<i>1.35</i>		<i>ug/L</i>	<i>2.006</i>		<i>67.3</i>	<i>43.1-133</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Kraemers
Project Number: 10476817
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- LC Results may be biased low because of low continuing calibration verification (CCV).
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

Chain of Custody

A192214



Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: MN
 Cert. Needed: Yes No

Workorder: 10476817 Workorder Name: 19-02057 MPCAKraemersMineSpr19 Owner Received Date: 5/29/2019 Results Requested By: 6/19/2019

Report To		Subcontract To				Requested Analysis																																	
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Madison 2525 Advance Road Madison, WI 53718 Phone (608)221-8700																																					
						<table border="1"> <tr> <td>MDA List 1</td> <td>MDA List 2</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>														MDA List 1	MDA List 2																		
MDA List 1	MDA List 2																																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	LAB USE ONLY																																
1	Seep 01	PS	5/29/2019 09:40	10476817001	Water	4	X	X											01																				
2	Discharge 01	PS	5/29/2019 10:30	10476817002	Water	4	X	X											02																				
3	Duplicate	PS	5/29/2019 10:40	10476817003	Water	4	X	X											03																				
4																																							
5																																							

Transfers						Comments													
Released By	Date/Time	Received By	Date/Time																
<i>[Signature]</i>	5/30/19 1510	<i>[Signature]</i>	5/31/19 1100	Need MPCA Equis EDD and Barr Equis 5 EDD															

Cooler Temperature on Receipt 3.2 °C Custody Seal or N Received on Ice or N Samples Intact or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

160142274 exp 7/13/19

June 25, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10477453

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Halverson, Pace Analytical Field Services
Chris Pelosi, Pace Analytical Services - Field Services



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10477453

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #: 74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Montana Certificate #CERT0103
Alaska Certification UST-107
Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203
Wisconsin DNR Certification #: 998027470
WA Department of Ecology Lab ID# C1007

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683

Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Pennsylvania Certification IDs

KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10477453001	FB-3	Water	06/03/19 13:50	06/03/19 16:20
10477453002	603282	Water	06/03/19 15:30	06/03/19 16:20
10477453003	M-3	Water	06/03/19 15:35	06/03/19 16:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10477453001	FB-3	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RH1	12	PASI-M
		EPA 8270D	STB	38	PASI-M
		EPA 900.0	NEG	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
10477453002	603282	EPA 8082A	RAG	11	PASI-M
		EPA 200.7	DM	9	PASI-M
		EPA 200.8	RH1	12	PASI-M
		EPA 8270D	STB	38	PASI-M
			CLJ	16	PASI-V
		EPA 900.0	NEG	2	PASI-PA
		EPA 300.0	KEO	1	PASI-M
		SM 3500-Cr B Modified	JFP	1	PASI-M
		EPA 350.1	CLJ	1	PASI-V
		EPA 350.1 rev. 2 (1993)	DMB	1	PASI-V
		SM 4500-CN-E	DCL	1	PASI-M
		10477453003	M-3	EPA 8082A	RAG
EPA 200.7	DM			9	PASI-M
EPA 200.8	RH1			12	PASI-M
EPA 8270D	STB			38	PASI-M
	CLJ			4	PASI-V
EPA 900.0	NEG			2	PASI-PA
EPA 300.0	KEO			1	PASI-M
SM 3500-Cr B Modified	JFP			1	PASI-M
EPA 350.1	CLJ			1	PASI-V
EPA 350.1 rev. 2 (1993)	DMB			1	PASI-V
SM 4500-CN-E	DCL			1	PASI-M

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Sample: FB-3	Lab ID: 10477453001	Collected: 06/03/19 13:50	Received: 06/03/19 16:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.11	1	06/06/19 18:14	06/11/19 01:47	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	30-125	1	06/06/19 18:14	06/11/19 01:47	877-09-8	
Decachlorobiphenyl (S)	99	%	30-125	1	06/06/19 18:14	06/11/19 01:47	2051-24-3	CH
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	06/11/19 08:26	06/12/19 13:58	7429-90-5	
Barium, Dissolved	ND	ug/L	10.0	1	06/11/19 08:26	06/12/19 13:58	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/11/19 08:26	06/12/19 13:58	7440-50-8	
Manganese, Dissolved	ND	ug/L	5.0	1	06/11/19 08:26	06/12/19 13:58	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	06/11/19 08:26	06/12/19 13:58	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/11/19 08:26	06/12/19 13:58	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	06/11/19 08:26	06/12/19 13:58	7440-31-5	
Total Hardness by 2340B, Dissolved	ND	ug/L	3300	1	06/11/19 08:26	06/12/19 13:58		
Zinc, Dissolved	ND	ug/L	20.0	1	06/11/19 08:26	06/12/19 13:58	7440-66-6	
200.8 MET ICPMS, Dissolved								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 22:55	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 22:55	7440-38-2	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/11/19 08:26	06/17/19 14:54	7440-41-7	
Boron, Dissolved	ND	ug/L	10.0	1	06/11/19 08:26	06/17/19 14:54	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	06/11/19 08:26	06/14/19 22:55	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 22:55	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 22:55	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	06/11/19 08:26	06/14/19 22:55	7439-92-1	
Selenium, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 22:55	7782-49-2	
Thallium, Dissolved	ND	ug/L	0.10	1	06/11/19 08:26	06/14/19 22:55	7440-28-0	
Uranium, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 22:55	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/11/19 08:26	06/14/19 22:55	7440-62-2	
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
Acenaphthene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	83-32-9	
Anthracene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	120-12-7	
Benzo(a)pyrene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	50-32-8	
Benzoic acid	ND	ug/L	52.6	1	06/05/19 18:26	06/09/19 22:02	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Sample: FB-3	Lab ID: 10477453001	Collected: 06/03/19 13:50	Received: 06/03/19 16:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
2-Chlorophenol	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	52.6	1	06/05/19 18:26	06/09/19 22:02	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	120-83-2	
Diethylphthalate	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	105-67-9	
Dimethylphthalate	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	84-74-2	
2,4-Dinitrophenol	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	51-28-5	
Di-n-octylphthalate	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	117-81-7	
Fluoranthene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	206-44-0	
Fluorene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	86-73-7	
Hexachlorobenzene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	52.6	1	06/05/19 18:26	06/09/19 22:02	77-47-4	L2
Hexachloroethane	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	67-72-1	L2
Isophorone	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	78-59-1	
2-Methylnaphthalene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02		
N-Nitrosodimethylamine	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	62-75-9	
Pentachlorophenol	ND	ug/L	21.1	1	06/05/19 18:26	06/09/19 22:02	87-86-5	
Phenanthrene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	85-01-8	
Phenol	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	108-95-2	
Pyrene	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	10.5	1	06/05/19 18:26	06/09/19 22:02	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	69	%	55-125	1	06/05/19 18:26	06/09/19 22:02	4165-60-0	
2-Fluorobiphenyl (S)	70	%	52-125	1	06/05/19 18:26	06/09/19 22:02	321-60-8	
p-Terphenyl-d14 (S)	77	%	57-125	1	06/05/19 18:26	06/09/19 22:02	1718-51-0	
Phenol-d6 (S)	75	%	30-125	1	06/05/19 18:26	06/09/19 22:02	13127-88-3	
2-Fluorophenol (S)	77	%	30-125	1	06/05/19 18:26	06/09/19 22:02	367-12-4	
2,4,6-Tribromophenol (S)	86	%	52-125	1	06/05/19 18:26	06/09/19 22:02	118-79-6	
300.0 IC Anions		Analytical Method: EPA 300.0						
Chloride	ND	mg/L	1.2	1		06/15/19 11:48	16887-00-6	
Chromium, Hexavalent		Analytical Method: SM 3500-Cr B Modified						
Chromium, Hexavalent	ND	mg/L	0.010	1		06/04/19 11:29		
350.1 Ammonia, Distilled		Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)						
Nitrogen, Ammonia	ND	mg/L	0.11	1	06/17/19 10:04	06/18/19 11:29	7664-41-7	
SM4500CN-E Cyanide		Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E						
Cyanide	ND	ug/L	20.0	1	06/14/19 10:28	06/14/19 12:44	57-12-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Sample: 603282		Lab ID: 10477453002		Collected: 06/03/19 15:30	Received: 06/03/19 16:20	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB		Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C						
PCB-1016 (Aroclor 1016)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.097	1	06/06/19 18:14	06/11/19 02:03	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	69	%	30-125	1	06/06/19 18:14	06/11/19 02:03	877-09-8	
Decachlorobiphenyl (S)	104	%	30-125	1	06/06/19 18:14	06/11/19 02:03	2051-24-3	CH
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Aluminum, Dissolved	ND	ug/L	200	1	06/11/19 08:26	06/12/19 14:00	7429-90-5	
Barium, Dissolved	76.6	ug/L	10.0	1	06/11/19 08:26	06/12/19 14:00	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/11/19 08:26	06/12/19 14:00	7440-50-8	
Manganese, Dissolved	667	ug/L	5.0	1	06/11/19 08:26	06/12/19 14:00	7439-96-5	
Nickel, Dissolved	ND	ug/L	20.0	1	06/11/19 08:26	06/12/19 14:00	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/11/19 08:26	06/12/19 14:00	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	06/11/19 08:26	06/12/19 14:00	7440-31-5	
Total Hardness by 2340B, Dissolved	992000	ug/L	3300	1	06/11/19 08:26	06/12/19 14:00		
Zinc, Dissolved	ND	ug/L	20.0	1	06/11/19 08:26	06/12/19 14:00	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:07	7440-36-0	
Arsenic, Dissolved	0.90	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:07	7440-38-2	
Beryllium, Dissolved	ND	ug/L	50.0	250	06/11/19 08:26	06/17/19 15:06	7440-41-7	D3
Boron, Dissolved	32700	ug/L	2500	250	06/11/19 08:26	06/17/19 15:06	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	06/11/19 08:26	06/14/19 23:07	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:07	7440-47-3	
Cobalt, Dissolved	3.8	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:07	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	06/11/19 08:26	06/14/19 23:07	7439-92-1	
Selenium, Dissolved	3.5	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:07	7782-49-2	
Thallium, Dissolved	0.76	ug/L	0.10	1	06/11/19 08:26	06/14/19 23:07	7440-28-0	
Uranium, Dissolved	15.9	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:07	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/11/19 08:26	06/14/19 23:07	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	83-32-9	
Anthracene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	50-32-8	
Benzoic acid	ND	ug/L	49.0	1	06/05/19 18:26	06/09/19 22:28	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	111-44-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Sample: 603282	Lab ID: 10477453002	Collected: 06/03/19 15:30	Received: 06/03/19 16:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
2-Chlorophenol	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.0	1	06/05/19 18:26	06/09/19 22:28	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	120-83-2	
Diethylphthalate	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	105-67-9	
Dimethylphthalate	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	117-81-7	
Fluoranthene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	206-44-0	
Fluorene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	86-73-7	
Hexachlorobenzene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.0	1	06/05/19 18:26	06/09/19 22:28	77-47-4	L2
Hexachloroethane	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	67-72-1	L2
Isophorone	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28		
N-Nitrosodimethylamine	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	62-75-9	
Pentachlorophenol	ND	ug/L	19.6	1	06/05/19 18:26	06/09/19 22:28	87-86-5	
Phenanthrene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	85-01-8	
Phenol	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	108-95-2	
Pyrene	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.8	1	06/05/19 18:26	06/09/19 22:28	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	77	%.	55-125	1	06/05/19 18:26	06/09/19 22:28	4165-60-0	
2-Fluorobiphenyl (S)	76	%.	52-125	1	06/05/19 18:26	06/09/19 22:28	321-60-8	
p-Terphenyl-d14 (S)	84	%.	57-125	1	06/05/19 18:26	06/09/19 22:28	1718-51-0	
Phenol-d6 (S)	78	%.	30-125	1	06/05/19 18:26	06/09/19 22:28	13127-88-3	
2-Fluorophenol (S)	79	%.	30-125	1	06/05/19 18:26	06/09/19 22:28	367-12-4	
2,4,6-Tribromophenol (S)	98	%.	52-125	1	06/05/19 18:26	06/09/19 22:28	118-79-6	

Field Data

Analytical Method:

Collected Date	06/03/19			1	06/03/19 15:30			
Collected Time	1530			1	06/03/19 15:30			
Field pH	7.0	Std. Units		1	06/03/19 15:30			
Field Temperature	10.0	deg C		1	06/03/19 15:30			
Field Specific Conductance	1870	umhos/cm		1	06/03/19 15:30			
Oxygen, Dissolved	0.5	mg/L		1	06/03/19 15:30		7782-44-7	
REDOX	-8	mV		1	06/03/19 15:30			
Turbidity	25.6	NTU		1	06/03/19 15:30			
Apparent Color	Clear			1	06/03/19 15:30			
Odor	No			1	06/03/19 15:30			
Well Locked	No-but bolted			1	06/03/19 15:30			

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Sample: 603282	Lab ID: 10477453002	Collected: 06/03/19 15:30	Received: 06/03/19 16:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data								
Analytical Method:								
Purge Method	Whale Pump			1		06/03/19 15:30		
Total Well Depth	32.12	feet		1		06/03/19 15:30		
Depth of Water	12.30			1		06/03/19 15:30		
Well Volume Purged	90.0			1		06/03/19 15:30		
Purge Rate	1.3			1		06/03/19 15:30		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	98.1	mg/L	1.2	1		06/15/19 23:10	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		06/04/19 11:29		
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/25/19 12:57		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	0.15	mg/L	0.11	1	06/17/19 10:04	06/18/19 11:30	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	06/14/19 10:28	06/14/19 12:47	57-12-5	

Sample: M-3	Lab ID: 10477453003	Collected: 06/03/19 15:35	Received: 06/03/19 16:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB								
Analytical Method: EPA 8082A Preparation Method: EPA Mod. 3510C								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	11096-82-5	
PCB-1262 (Aroclor 1262)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	37324-23-5	
PCB-1268 (Aroclor 1268)	ND	ug/L	0.098	1	06/06/19 18:14	06/11/19 02:19	11100-14-4	
Surrogates								
Tetrachloro-m-xylene (S)	72	%	30-125	1	06/06/19 18:14	06/11/19 02:19	877-09-8	
Decachlorobiphenyl (S)	109	%	30-125	1	06/06/19 18:14	06/11/19 02:19	2051-24-3	CH
200.7 MET ICP, Dissolved								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Aluminum, Dissolved	ND	ug/L	200	1	06/11/19 08:26	06/12/19 14:02	7429-90-5	
Barium, Dissolved	76.5	ug/L	10.0	1	06/11/19 08:26	06/12/19 14:02	7440-39-3	
Copper, Dissolved	ND	ug/L	10.0	1	06/11/19 08:26	06/12/19 14:02	7440-50-8	
Manganese, Dissolved	672	ug/L	5.0	1	06/11/19 08:26	06/12/19 14:02	7439-96-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Sample: M-3	Lab ID: 10477453003	Collected: 06/03/19 15:35	Received: 06/03/19 16:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Nickel, Dissolved	ND	ug/L	20.0	1	06/11/19 08:26	06/12/19 14:02	7440-02-0	
Silver, Dissolved	ND	ug/L	10.0	1	06/11/19 08:26	06/12/19 14:02	7440-22-4	
Tin, Dissolved	ND	ug/L	75.0	1	06/11/19 08:26	06/12/19 14:02	7440-31-5	
Total Hardness by 2340B, Dissolved	984000	ug/L	3300	1	06/11/19 08:26	06/12/19 14:02		
Zinc, Dissolved	ND	ug/L	20.0	1	06/11/19 08:26	06/12/19 14:02	7440-66-6	
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:10	7440-36-0	
Arsenic, Dissolved	0.91	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:10	7440-38-2	
Beryllium, Dissolved	ND	ug/L	50.0	250	06/11/19 08:26	06/17/19 15:09	7440-41-7	D3
Boron, Dissolved	28900	ug/L	2500	250	06/11/19 08:26	06/17/19 15:09	7440-42-8	
Cadmium, Dissolved	ND	ug/L	0.080	1	06/11/19 08:26	06/14/19 23:10	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:10	7440-47-3	
Cobalt, Dissolved	3.9	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:10	7440-48-4	
Lead, Dissolved	ND	ug/L	0.10	1	06/11/19 08:26	06/14/19 23:10	7439-92-1	
Selenium, Dissolved	3.3	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:10	7782-49-2	
Thallium, Dissolved	0.74	ug/L	0.10	1	06/11/19 08:26	06/14/19 23:10	7440-28-0	
Uranium, Dissolved	16.2	ug/L	0.50	1	06/11/19 08:26	06/14/19 23:10	7440-61-1	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/11/19 08:26	06/14/19 23:10	7440-62-2	
8270D MSSV		Analytical Method: EPA 8270D Preparation Method: EPA 3520						
Acenaphthene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	83-32-9	
Anthracene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	120-12-7	
Benzo(a)pyrene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	50-32-8	
Benzoic acid	ND	ug/L	49.5	1	06/05/19 18:26	06/09/19 22:54	65-85-0	
4-Bromophenylphenyl ether	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	101-55-3	
Butylbenzylphthalate	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	111-44-4	
2-Chlorophenol	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	49.5	1	06/05/19 18:26	06/09/19 22:54	91-94-1	
2,4-Dichlorophenol	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	120-83-2	
Diethylphthalate	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	84-66-2	
2,4-Dimethylphenol	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	105-67-9	
Dimethylphthalate	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	131-11-3	
Di-n-butylphthalate	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	84-74-2	
2,4-Dinitrophenol	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	51-28-5	
Di-n-octylphthalate	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	117-81-7	
Fluoranthene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	206-44-0	
Fluorene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	86-73-7	
Hexachlorobenzene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	49.5	1	06/05/19 18:26	06/09/19 22:54	77-47-4	L2
Hexachloroethane	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	67-72-1	L2
Isophorone	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	78-59-1	
2-Methylnaphthalene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	95-48-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Sample: M-3	Lab ID: 10477453003	Collected: 06/03/19 15:35	Received: 06/03/19 16:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV								
Analytical Method: EPA 8270D Preparation Method: EPA 3520								
3&4-Methylphenol(m&p Cresol)	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54		
N-Nitrosodimethylamine	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	62-75-9	
Pentachlorophenol	ND	ug/L	19.8	1	06/05/19 18:26	06/09/19 22:54	87-86-5	
Phenanthrene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	85-01-8	
Phenol	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	108-95-2	
Pyrene	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	129-00-0	
2,4,6-Trichlorophenol	ND	ug/L	9.9	1	06/05/19 18:26	06/09/19 22:54	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	73	%	55-125	1	06/05/19 18:26	06/09/19 22:54	4165-60-0	
2-Fluorobiphenyl (S)	68	%	52-125	1	06/05/19 18:26	06/09/19 22:54	321-60-8	
p-Terphenyl-d14 (S)	79	%	57-125	1	06/05/19 18:26	06/09/19 22:54	1718-51-0	
Phenol-d6 (S)	75	%	30-125	1	06/05/19 18:26	06/09/19 22:54	13127-88-3	
2-Fluorophenol (S)	74	%	30-125	1	06/05/19 18:26	06/09/19 22:54	367-12-4	
2,4,6-Tribromophenol (S)	96	%	52-125	1	06/05/19 18:26	06/09/19 22:54	118-79-6	
Field Data								
Analytical Method:								
Collected Date	06/03/19			1		06/03/19 15:35		
Collected Time	1535			1		06/03/19 15:35		
Field pH	7.0	Std. Units		1		06/03/19 15:35		
Field Temperature	10.0	deg C		1		06/03/19 15:35		
300.0 IC Anions								
Analytical Method: EPA 300.0								
Chloride	96.0	mg/L	1.2	1		06/15/19 23:25	16887-00-6	
Chromium, Hexavalent								
Analytical Method: SM 3500-Cr B Modified								
Chromium, Hexavalent	ND	mg/L	0.010	1		06/04/19 11:29		
350.1 Ammonia, Unionized								
Analytical Method: EPA 350.1								
Nitrogen, Ammonia (Unionized)	ND	mg/L	0.010	1		06/25/19 12:57		
350.1 Ammonia, Distilled								
Analytical Method: EPA 350.1 rev. 2 (1993) Preparation Method: EPA 350.1 rev. 2 (1993)								
Nitrogen, Ammonia	0.16	mg/L	0.11	1	06/17/19 10:04	06/18/19 11:32	7664-41-7	
SM4500CN-E Cyanide								
Analytical Method: SM 4500-CN-E Preparation Method: SM 4500-CN-E								
Cyanide	ND	ug/L	20.0	1	06/14/19 10:28	06/14/19 12:47	57-12-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

QC Batch: 610848 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 10477453001, 10477453002, 10477453003

METHOD BLANK: 3300567 Matrix: Water

Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	200	06/12/19 13:38	
Barium, Dissolved	ug/L	ND	10.0	06/12/19 13:38	
Copper, Dissolved	ug/L	ND	10.0	06/12/19 13:38	
Manganese, Dissolved	ug/L	ND	5.0	06/12/19 13:38	
Nickel, Dissolved	ug/L	ND	20.0	06/12/19 13:38	
Silver, Dissolved	ug/L	ND	10.0	06/12/19 13:38	
Tin, Dissolved	ug/L	ND	75.0	06/12/19 13:38	
Zinc, Dissolved	ug/L	ND	20.0	06/12/19 13:38	

LABORATORY CONTROL SAMPLE: 3300568

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	22100	111	85-115	
Barium, Dissolved	ug/L	1000	1040	104	85-115	
Copper, Dissolved	ug/L	1000	1000	100	85-115	
Manganese, Dissolved	ug/L	1000	1050	105	85-115	
Nickel, Dissolved	ug/L	1000	1030	103	85-115	
Silver, Dissolved	ug/L	500	522	104	85-115	
Tin, Dissolved	ug/L	1000	1030	103	85-115	
Zinc, Dissolved	ug/L	1000	1050	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3300569 3300570

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10477507001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	<21.4	20000	20000	23500	23400	118	117	70-130	1	20
Barium, Dissolved	ug/L	413	1000	1000	1480	1480	107	106	70-130	0	20
Copper, Dissolved	ug/L	6.3J	1000	1000	1070	1070	107	106	70-130	0	20
Manganese, Dissolved	ug/L	136	1000	1000	1220	1200	108	107	70-130	1	20
Nickel, Dissolved	ug/L	2.6J	1000	1000	1030	1020	102	102	70-130	0	20
Silver, Dissolved	ug/L	<0.40	500	500	561	559	112	112	70-130	0	20
Tin, Dissolved	ug/L	<3.2	1000	1000	1040	1050	104	105	70-130	1	20
Zinc, Dissolved	ug/L	47.4	1000	1000	1090	1080	104	104	70-130	0	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

QC Batch: 610854 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 10477453001, 10477453002, 10477453003

METHOD BLANK: 3300595 Matrix: Water

Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	06/14/19 22:48	
Arsenic, Dissolved	ug/L	ND	0.50	06/14/19 22:48	
Beryllium, Dissolved	ug/L	ND	0.20	06/17/19 14:29	
Boron, Dissolved	ug/L	ND	10.0	06/17/19 14:29	
Cadmium, Dissolved	ug/L	ND	0.080	06/14/19 22:48	
Chromium, Dissolved	ug/L	ND	0.50	06/14/19 22:48	
Cobalt, Dissolved	ug/L	ND	0.50	06/14/19 22:48	
Lead, Dissolved	ug/L	ND	0.10	06/14/19 22:48	
Selenium, Dissolved	ug/L	ND	0.50	06/14/19 22:48	
Thallium, Dissolved	ug/L	ND	0.10	06/14/19 22:48	
Uranium, Dissolved	ug/L	ND	0.50	06/14/19 22:48	
Vanadium, Dissolved	ug/L	ND	1.0	06/14/19 22:48	

LABORATORY CONTROL SAMPLE: 3300596

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	100	105	105	85-115	
Arsenic, Dissolved	ug/L	100	94.3	94	85-115	
Beryllium, Dissolved	ug/L	100	99.3	99	85-115	
Boron, Dissolved	ug/L	100	95.2	95	85-115	
Cadmium, Dissolved	ug/L	100	102	102	85-115	
Chromium, Dissolved	ug/L	100	102	102	85-115	
Cobalt, Dissolved	ug/L	100	103	103	85-115	
Lead, Dissolved	ug/L	100	106	106	85-115	
Selenium, Dissolved	ug/L	100	99.4	99	85-115	
Thallium, Dissolved	ug/L	100	102	102	85-115	
Uranium, Dissolved	ug/L	100	96.6	97	85-115	
Vanadium, Dissolved	ug/L	100	104	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3300597 3300598

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10477453001 Result	Spike Conc.	Spike Conc.	Conc.								
Antimony, Dissolved	ug/L	ND	100	100	103	104	103	104	70-130	1	20		
Arsenic, Dissolved	ug/L	ND	100	100	93.0	97.6	93	98	70-130	5	20		
Beryllium, Dissolved	ug/L	ND	100	100	98.0	102	98	102	70-130	4	20		
Boron, Dissolved	ug/L	ND	100	100	93.5	99.2	93	99	70-130	6	20		
Cadmium, Dissolved	ug/L	ND	100	100	103	106	103	106	70-130	3	20		

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Parameter	Units	3300597		3300598		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10477453001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Chromium, Dissolved	ug/L	ND	100	100	102	104	101	104	70-130	3	20		
Cobalt, Dissolved	ug/L	ND	100	100	102	105	102	105	70-130	3	20		
Lead, Dissolved	ug/L	ND	100	100	103	110	103	110	70-130	7	20		
Selenium, Dissolved	ug/L	ND	100	100	98.8	103	99	103	70-130	4	20		
Thallium, Dissolved	ug/L	ND	100	100	98.5	105	98	105	70-130	7	20		
Uranium, Dissolved	ug/L	ND	100	100	97.3	100	97	100	70-130	3	20		
Vanadium, Dissolved	ug/L	ND	100	100	103	107	103	107	70-130	4	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

QC Batch: 611018 Analysis Method: EPA 8082A
QC Batch Method: EPA Mod. 3510C Analysis Description: 8082A GCS PCB
Associated Lab Samples: 10477453001, 10477453002, 10477453003

METHOD BLANK: 3301148 Matrix: Water

Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	06/10/19 23:57	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	06/10/19 23:57	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	06/10/19 23:57	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	06/10/19 23:57	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	06/10/19 23:57	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	06/10/19 23:57	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	06/10/19 23:57	
PCB-1262 (Aroclor 1262)	ug/L	ND	0.10	06/10/19 23:57	
PCB-1268 (Aroclor 1268)	ug/L	ND	0.10	06/10/19 23:57	
Decachlorobiphenyl (S)	%	121	30-125	06/10/19 23:57	CH
Tetrachloro-m-xylene (S)	%	74	30-125	06/10/19 23:57	

LABORATORY CONTROL SAMPLE & LCSD: 3301149 3301150

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	20	17.4	17.2	87	86	45-125	1	20	
PCB-1260 (Aroclor 1260)	ug/L	20	18.5	18.4	93	92	49-125	1	20	
Decachlorobiphenyl (S)	%				116	92	30-125			CH
Tetrachloro-m-xylene (S)	%				63	56	30-125			

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

QC Batch: 610683 Analysis Method: EPA 8270D
QC Batch Method: EPA 3520 Analysis Description: 8270D Water MSSV
Associated Lab Samples: 10477453001, 10477453002, 10477453003

METHOD BLANK: 3299553 Matrix: Water
Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2,4,6-Trichlorophenol	ug/L	ND	10.0	06/09/19 17:17	
2,4-Dichlorophenol	ug/L	ND	10.0	06/09/19 17:17	
2,4-Dimethylphenol	ug/L	ND	10.0	06/09/19 17:17	
2,4-Dinitrophenol	ug/L	ND	10.0	06/09/19 17:17	
2-Chlorophenol	ug/L	ND	10.0	06/09/19 17:17	
2-Methylnaphthalene	ug/L	ND	10.0	06/09/19 17:17	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	06/09/19 17:17	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	10.0	06/09/19 17:17	
3,3'-Dichlorobenzidine	ug/L	ND	50.0	06/09/19 17:17	
4-Bromophenylphenyl ether	ug/L	ND	10.0	06/09/19 17:17	
Acenaphthene	ug/L	ND	10.0	06/09/19 17:17	
Anthracene	ug/L	ND	10.0	06/09/19 17:17	
Benzo(a)pyrene	ug/L	ND	10.0	06/09/19 17:17	
Benzoic acid	ug/L	ND	50.0	06/09/19 17:17	
bis(2-Chloroethyl) ether	ug/L	ND	10.0	06/09/19 17:17	
bis(2-Ethylhexyl)phthalate	ug/L	ND	10.0	06/09/19 17:17	
Butylbenzylphthalate	ug/L	ND	10.0	06/09/19 17:17	
Di-n-butylphthalate	ug/L	ND	10.0	06/09/19 17:17	
Di-n-octylphthalate	ug/L	ND	10.0	06/09/19 17:17	
Diethylphthalate	ug/L	ND	10.0	06/09/19 17:17	
Dimethylphthalate	ug/L	ND	10.0	06/09/19 17:17	
Fluoranthene	ug/L	ND	10.0	06/09/19 17:17	
Fluorene	ug/L	ND	10.0	06/09/19 17:17	
Hexachlorobenzene	ug/L	ND	10.0	06/09/19 17:17	
Hexachlorocyclopentadiene	ug/L	ND	50.0	06/09/19 17:17	
Hexachloroethane	ug/L	ND	10.0	06/09/19 17:17	
Isophorone	ug/L	ND	10.0	06/09/19 17:17	
N-Nitrosodimethylamine	ug/L	ND	10.0	06/09/19 17:17	
Pentachlorophenol	ug/L	ND	20.0	06/09/19 17:17	
Phenanthrene	ug/L	ND	10.0	06/09/19 17:17	
Phenol	ug/L	ND	10.0	06/09/19 17:17	
Pyrene	ug/L	ND	10.0	06/09/19 17:17	
2,4,6-Tribromophenol (S)	%	72	52-125	06/09/19 17:17	
2-Fluorobiphenyl (S)	%	36	52-125	06/09/19 17:17	S0
2-Fluorophenol (S)	%	57	30-125	06/09/19 17:17	
Nitrobenzene-d5 (S)	%	56	55-125	06/09/19 17:17	
p-Terphenyl-d14 (S)	%	67	57-125	06/09/19 17:17	
Phenol-d6 (S)	%	59	30-125	06/09/19 17:17	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

LABORATORY CONTROL SAMPLE & LCSD: 3299554			3299555								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
2,4,6-Trichlorophenol	ug/L	50	39.3	45.2	79	90	60-125	14	20		
2,4-Dichlorophenol	ug/L	50	35.4	40.9	71	82	56-125	14	20		
2,4-Dimethylphenol	ug/L	50	32.2	34.4	64	69	33-125	7	20		
2,4-Dinitrophenol	ug/L	50	29.3	35.3	59	71	32-125	19	20		
2-Chlorophenol	ug/L	50	33.5	37.1	67	74	52-125	10	20		
2-Methylnaphthalene	ug/L	50	29.2	34.8	58	70	52-125	18	20		
2-Methylphenol(o-Cresol)	ug/L	50	35.9	40.2	72	80	55-125	11	20		
3&4-Methylphenol(m&p Cresol)	ug/L	50	36.0	40.5	72	81	57-125	12	20		
3,3'-Dichlorobenzidine	ug/L	50	39.8J	45.5J	80	91	39-150		20		
4-Bromophenylphenyl ether	ug/L	50	35.7	43.9	71	88	61-125	21	20	R1	
Acenaphthene	ug/L	50	35.8	42.5	72	85	59-125	17	20		
Anthracene	ug/L	50	38.1	46.1	76	92	64-125	19	20		
Benzo(a)pyrene	ug/L	50	38.3	45.2	77	90	63-125	17	20		
Benzoic acid	ug/L	50	29.1J	32J	58	64	30-125		20		
bis(2-Chloroethyl) ether	ug/L	50	34.4	38.4	69	77	49-125	11	20		
bis(2-Ethylhexyl)phthalate	ug/L	50	39.0	47.2	78	94	68-125	19	20		
Butylbenzylphthalate	ug/L	50	37.9	45.5	76	91	67-125	18	20		
Di-n-butylphthalate	ug/L	50	39.1	46.0	78	92	67-125	16	20		
Di-n-octylphthalate	ug/L	50	36.7	46.0	73	92	67-125	23	20	R1	
Diethylphthalate	ug/L	50	38.4	46.8	77	94	64-125	20	20		
Dimethylphthalate	ug/L	50	40.7	45.8	81	92	65-125	12	20		
Fluoranthene	ug/L	50	39.7	46.5	79	93	64-125	16	20		
Fluorene	ug/L	50	36.4	44.8	73	90	63-125	21	20	R1	
Hexachlorobenzene	ug/L	50	36.5	43.8	73	88	61-125	18	20		
Hexachlorocyclopentadiene	ug/L	50	ND	ND	13	13	30-125		20	L2	
Hexachloroethane	ug/L	50	14.2	17.5	28	35	30-125	21	20	L2,R1	
Isophorone	ug/L	50	38.1	43.3	76	87	59-125	13	20		
N-Nitrosodimethylamine	ug/L	50	33.8	36.4	68	73	43-125	7	20		
Pentachlorophenol	ug/L	50	35.0	41.9	70	84	35-125	18	20		
Phenanthrene	ug/L	50	38.9	45.6	78	91	65-125	16	20		
Phenol	ug/L	50	34.1	37.4	68	75	54-125	9	20		
Pyrene	ug/L	50	38.2	47.9	76	96	65-125	23	20	R1	
2,4,6-Tribromophenol (S)	%				74	87	52-125				
2-Fluorobiphenyl (S)	%				63	76	52-125				
2-Fluorophenol (S)	%				65	69	30-125				
Nitrobenzene-d5 (S)	%				67	73	55-125				
p-Terphenyl-d14 (S)	%				72	85	57-125				
Phenol-d6 (S)	%				63	68	30-125				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

QC Batch: 612881 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 10477453001, 10477453002, 10477453003

METHOD BLANK: 3311550 Matrix: Water

Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	06/15/19 12:03	

LABORATORY CONTROL SAMPLE: 3311551

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.1	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3311552 3311553

Parameter	Units	10478124001		3311552		3311553		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chloride	mg/L	6.2	12.5	12.5	16.9	16.6	86	83	90-110	2	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3311554 3311555

Parameter	Units	10478124002		3311554		3311555		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chloride	mg/L	9.0	12.5	12.5	19.3	20.0	83	88	90-110	4	20 M1

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10477453

QC Batch: 610273 Analysis Method: SM 3500-Cr B Modified
QC Batch Method: SM 3500-Cr B Modified Analysis Description: Chromium, Hexavalent by 3500
Associated Lab Samples: 10477453001, 10477453002, 10477453003

METHOD BLANK: 3297870 Matrix: Water
Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	ND	0.010	06/04/19 11:29	

LABORATORY CONTROL SAMPLE: 3297871

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	0.2	0.19	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3297872 3297873

Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		10477314001 Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chromium, Hexavalent	mg/L	ND	0.2	0.2	0.18	0.19	88	89	85-115	1	20	H3	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT
Pace Project No.: 10477453

QC Batch: 168227 Analysis Method: EPA 350.1 rev. 2 (1993)
QC Batch Method: EPA 350.1 rev. 2 (1993) Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 10477453001, 10477453002, 10477453003

METHOD BLANK: 663794 Matrix: Water
Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.11	06/18/19 11:10	

LABORATORY CONTROL SAMPLE: 663795

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.6	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 663796 663797

Parameter	Units	12130248002		MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	0.19	5	5	5	4.8	4.7	92	91	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 663798 663799

Parameter	Units	12130437002		MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.								
Nitrogen, Ammonia	mg/L	<0.11	5	5	5	4.6	4.7	89	92	90-110	3	10 M1	

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QUALITY CONTROL DATA

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

QC Batch: 612850

Analysis Method: SM 4500-CN-E

QC Batch Method: SM 4500-CN-E

Analysis Description: SM4500CN-E Cyanide

Associated Lab Samples: 10477453001, 10477453002, 10477453003

METHOD BLANK: 3311476

Matrix: Water

Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cyanide	ug/L	ND	20.0	06/14/19 12:26	

LABORATORY CONTROL SAMPLE: 3311477

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cyanide	ug/L	250	238	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3311478 3311479

Parameter	Units	10478055001		MS		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Cyanide	ug/L	ND	250	250	250	224	239	85	91	80-120	6	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3311480 3311481

Parameter	Units	10478819001		MS		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Cyanide	ug/L	ND	250	250	250	246	241	95	94	80-120	2	30	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	-0.177 ± 0.292 (0.659) C:NA T:NA	pCi/L	06/11/19 19:41	12587-46-1	
Gross Beta		EPA 900.0	-0.092 ± 0.420 (0.852) C:NA T:NA	pCi/L	06/11/19 19:41	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	16.8 ± 5.79 (6.97) C:NA T:NA	pCi/L	06/11/19 19:41	12587-46-1	
Gross Beta		EPA 900.0	10.8 ± 3.79 (5.43) C:NA T:NA	pCi/L	06/11/19 19:41	12587-47-2	

Parameters		Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha		EPA 900.0	17.0 ± 5.59 (6.41) C:NA T:NA	pCi/L	06/11/19 19:41	12587-46-1	
Gross Beta		EPA 900.0	5.43 ± 2.76 (4.49) C:NA T:NA	pCi/L	06/11/19 19:41	12587-47-2	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

QC Batch:	346398	Analysis Method:	EPA 900.0
QC Batch Method:	EPA 900.0	Analysis Description:	900.0 Gross Alpha/Beta
Associated Lab Samples:	10477453001, 10477453002, 10477453003		

METHOD BLANK: 1685375 Matrix: Water

Associated Lab Samples: 10477453001, 10477453002, 10477453003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	1.23 ± 0.820 (1.20) C:NA T:NA	pCi/L	06/12/19 08:34	
Gross Beta	1.12 ± 0.930 (1.82) C:NA T:NA	pCi/L	06/12/19 08:34	

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-PA Pace Analytical Services - Greensburg

PASI-V Pace Analytical Services - Virginia

WORKORDER QUALIFIERS

WO: 10477453

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

BATCH QUALIFIERS

Batch: 611418

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALIFIERS

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

ANALYTE QUALIFIERS

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H3	Sample was received or analysis requested beyond the recognized method holding time.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-01567 MPCA Freeway LF 19 WT

Pace Project No.: 10477453

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10477453001	FB-3	EPA Mod. 3510C	611018	EPA 8082A	611418
10477453002	603282	EPA Mod. 3510C	611018	EPA 8082A	611418
10477453003	M-3	EPA Mod. 3510C	611018	EPA 8082A	611418
10477453001	FB-3	EPA 200.7	610848	EPA 200.7	612165
10477453002	603282	EPA 200.7	610848	EPA 200.7	612165
10477453003	M-3	EPA 200.7	610848	EPA 200.7	612165
10477453001	FB-3	EPA 200.8	610854	EPA 200.8	612825
10477453002	603282	EPA 200.8	610854	EPA 200.8	612825
10477453003	M-3	EPA 200.8	610854	EPA 200.8	612825
10477453001	FB-3	EPA 3520	610683	EPA 8270D	611521
10477453002	603282	EPA 3520	610683	EPA 8270D	611521
10477453003	M-3	EPA 3520	610683	EPA 8270D	611521
10477453002	603282				
10477453003	M-3				
10477453001	FB-3	EPA 900.0	346398		
10477453002	603282	EPA 900.0	346398		
10477453003	M-3	EPA 900.0	346398		
10477453001	FB-3	EPA 300.0	612881		
10477453002	603282	EPA 300.0	612881		
10477453003	M-3	EPA 300.0	612881		
10477453001	FB-3	SM 3500-Cr B Modified	610273		
10477453002	603282	SM 3500-Cr B Modified	610273		
10477453003	M-3	SM 3500-Cr B Modified	610273		
10477453002	603282	EPA 350.1			
10477453003	M-3	EPA 350.1			
10477453001	FB-3	EPA 350.1 rev. 2 (1993)	168227	EPA 350.1 rev. 2 (1993)	168372
10477453002	603282	EPA 350.1 rev. 2 (1993)	168227	EPA 350.1 rev. 2 (1993)	168372
10477453003	M-3	EPA 350.1 rev. 2 (1993)	168227	EPA 350.1 rev. 2 (1993)	168372
10477453001	FB-3	SM 4500-CN-E	612850	SM 4500-CN-E	612958
10477453002	603282	SM 4500-CN-E	612850	SM 4500-CN-E	612958
10477453003	M-3	SM 4500-CN-E	612850	SM 4500-CN-E	612958

REPORT OF LABORATORY ANALYSIS

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WO#: 10477453



Minnesota Pollution Control Agency

Chain-of-Custody Form revision 2013.0909

Work Order
Turnaround

Page: / of /

PROJECT/CLIENT INFO

LABORATORY

FOR LAB USE ONLY

Facility Code: MNSW-057	Program Code (MDH Lab Only):	Lab Name: Pace Analytical - Minneapolis, MN
Project Name: 19-01567 MPCA Freeway Landfill 2019 Waters	Project Task Code: PRJ07786	Address: 1700 SE Elm Street
Project Manager: Brad Jacobson	612-607-6375	Minneapolis MN 55414
Potential Hazard?	If yes, add information to Sampler Comments Section	Phone No: 612-607-6400

SAMPLE DETAILS

ANALYSIS REQUESTED

SAMPLE TYPE CODES Sample-Routine Sample S-IVP-Integrated Vertical Profile Sample S-CWOP-Composite Sample	QC-FB =Field Blank Sample QC-FR =Field Replicate Sample QC-TB =Trip Blank Sample	LAB MATRIX CODES DW=Drinking Water NW=Non-potable Water SD=Soil/Solid WP=Wipe	AR =Air BL =Biological Material OT =Other TS =Tissue	FIELD MATRIX CODES Wtr-Ground=Groundwater Wtr-Surf=Surface Water QC-BLANK=Artificial Blank Water Leachate=Leachate Sample
--	---	--	---	--

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	Field Parameters: SWL, Temp, pH, DO, Cond, Eh, Turbidity	Metals 200.7 / 200.8 / Gross Alpha/Beta - QAPP Table 3a	300.0 / HexCy - QAPP Table 3a	Ammonia/ Unionized NH3 - QAPP Table 3a	Total Cyanide / Free Cyanide - QAPP Table 3a	8270 SVOC, 8082, MDA1, MDA2 - QAPP Table 3a	Lab Sample No.	#
FB-3	QC-FB	6/3/19	1350			G	NW	BLANK	N	(Field Blank 3)	14	None								1
603282	Sample	6/3/19	1530			G	NW	Wtr-Ground	N	(MW-97-2)	14	X	X	X	X	X	X	X		2
M-3	QC-FR	6/3/19	1535			G	NW	Wtr-Ground	N	(Duplicate 3)	14	X	X	X	X	X	X	X		3
									N											4
									N											5
									N											6
									N											7
									N											8
									N											9
									N											10

Sampled By: David Anderson
Sampler's Signature: David Anderson
Phone #:

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
David Anderson / Pace Analytical	6/3/19 / 1620	Elizabeth R3 / PACE	6/4/19 8:39 6/3/19 1620

w1
w2
w3

ER2 6/4/19

Sample Condition Upon Receipt

Client Name: Minnesota Pollution Control Agency Project #: _____

WO#: 10477453
 PM: JMA Due Date: 06/17/19
 CLIENT: PASI-MNFLD

Courier: Fed Ex UPS USPS Client
 Pace SpeeDee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Biological Tissue Frozen? Yes No N/A

Packing Material: Bubble Wrap Bubble Bags None Other: PB Temp Blank? Yes No

Thermometer: T1(0461) T2(1336) T3(0459)
 T4(0254) T5(0489) Type of Ice: Wet Blue None Dry Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	Cooler Temp Read w/temp blank: <u>4.5, 7.7, 3.8</u> °C	Average Corrected Temp (no temp blank only): _____ °C	See Exceptions <input type="checkbox"/>
Correction Factor: <u>TRUE</u>	Cooler Temp Corrected w/temp blank: <u>4.5, 7.7, 3.8</u> °C		

USDA Regulated Soil: (N/A, water sample/Other: _____) Date/initials of Person Examining Contents: ERZ 6/4/19
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present and Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input checked="" type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input checked="" type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: <input type="checkbox"/> See Exception
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO ₃ <input checked="" type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> Zinc Acetate <u>1-3: 2/2</u> <u>2/2</u> <u>V1</u>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Chlorine? <input checked="" type="checkbox"/> No pH Paper Lot#
	Res. Chlorine <u>9016</u> 0-6 Roll <u>203619</u> 0-6 Strip <u>10D2981</u> 0-14 Strip
Headspace in VOA Vials (greater than 6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> See Exception
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased):

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: _____ Date/Time: _____ Field Data Required? Yes No
 Comments/Resolution: _____

Project Manager Review:

J. Anderson Date: 06/04/2019

Note: Whenever there is a discrepancy in testing North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: FE



Document Name:
Sample Condition Upon Receipt Form
Document No.:
F-VM-C-001-rev.13

Document Revised: 30Apr2019
Page 1 of 1
Issuing Authority:
Pace Virginia Minnesota Quality Office

Sample Condition Upon Receipt

Client Name:

Project #:

WO#: 12125872

PM: CLJ

Due Date: 06/24/19

CLIENT: PACE MPLS

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer Used: 140792808 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.1 Cooler Temp Corrected °C: 3.4 Biological Tissue Frozen? Yes No NA

Temp should be above freezing to 6 °C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 6/4/19 DC

Comments: Bm 6/4/19

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation properly preserved?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. Note samples needing adjustment:
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Nikki Jarve

Date: 6/5/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace MN

Project # 30297978

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Label	<u>ET</u>
LIMS Login	<u>ET</u>

Tracking #: 4638 0197 6406

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used 11 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 3.1 °C Correction Factor: 0.0 °C Final Temp: 3.1 °C
Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>ET 6-5-19</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ET</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ET</u> Date: <u>6-5-19</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.



19-Jun-2019

Jennifer Anderson
Pace Analytical Services, LLC
1700 Elm Street
Suite 200
Minneapolis, MN 55414

Re: **10477453**

Work Order: **19060283**

Dear Jennifer,

ALS Environmental received 3 samples on 05-Jun-2019 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 9.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton", is written over a light blue horizontal line.

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Pace Analytical Services, LLC
Project: 10477453
Work Order: 19060283

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
19060283-01	FB-3	Water		6/3/2019 13:50	6/5/2019 09:30	<input type="checkbox"/>
19060283-02	603282	Water		6/3/2019 15:30	6/5/2019 09:30	<input type="checkbox"/>
19060283-03	M-3	Water		6/3/2019 15:35	6/5/2019 09:30	<input type="checkbox"/>

Client: Pace Analytical Services, LLC
Project: 10477453
WorkOrder: 19060283

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCS D	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
µg/L	Micrograms per Liter

ALS Group, USA

Date: 19-Jun-19

Client: Pace Analytical Services, LLC

Project: 10477453

Work Order: 19060283

Sample ID: FB-3

Lab ID: 19060283-01

Collection Date: 6/3/2019 01:50 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	6/12/2019 02:05 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 19-Jun-19

Client: Pace Analytical Services, LLC

Project: 10477453

Work Order: 19060283

Sample ID: 603282

Lab ID: 19060283-02

Collection Date: 6/3/2019 03:30 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	6/12/2019 02:05 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 19-Jun-19

Client: Pace Analytical Services, LLC

Project: 10477453

Work Order: 19060283

Sample ID: M-3

Lab ID: 19060283-03

Collection Date: 6/3/2019 03:35 PM

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, FREE			SW9014			Analyst: RZM
Cyanide, Free	ND		20	µg/L	1	6/12/2019 02:05 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Pace Analytical Services, LLC
Work Order: 19060283
Project: 10477453

QC BATCH REPORT

Batch ID: **R262499** Instrument ID **WETCHEM** Method: **SW9014**

MBLK		Sample ID: MB-R262499-R262499				Units: µg/L		Analysis Date: 6/12/2019 02:05 PM		
Client ID:		Run ID: WETCHEM_190612U		SeqNo: 5711012		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	ND	20								

LCS		Sample ID: LCS-R262499-R262499				Units: µg/L		Analysis Date: 6/12/2019 02:05 PM		
Client ID:		Run ID: WETCHEM_190612U		SeqNo: 5711013		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	271.2	20	250	0	108	81-119	0			

MS		Sample ID: 19052116-01A MS				Units: µg/L		Analysis Date: 6/12/2019 02:05 PM		
Client ID:		Run ID: WETCHEM_190612U		SeqNo: 5711015		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	112.1	20	250	-11.2	49.3	81-119	0			S

MSD		Sample ID: 19052116-01A MSD				Units: µg/L		Analysis Date: 6/12/2019 02:05 PM		
Client ID:		Run ID: WETCHEM_190612U		SeqNo: 5711016		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Free	77.26	20	250	-11.2	35.4	81-119	112.1	36.8	20	SR

The following samples were analyzed in this batch:

19060283-01A	19060283-02A	19060283-03A
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Sample Receipt Checklist

Client Name: **PACE MN**

Date/Time Received: **05-Jun-19 09:30**

Work Order: **19060283**

Received by: **DS**

Checklist completed by Diane Shaw 05-Jun-19
eSignature Date

Reviewed by: Chad Whilton 06-Jun-19
eSignature Date

Matrices: Water

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No
- Sample(s) received on ice? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

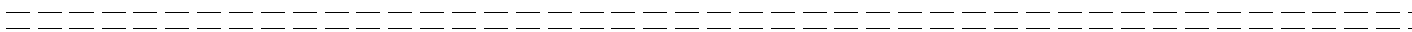
Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:



Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



2525 Advance Road
Madison, WI 53718
608.221.8700 Phone
608.221.4889 Fax

June 18, 2019

Jennifer Anderson
Pace Analytical
1700 Elm Street, Suite 200
Minneapolis, MN 55414

RE: MPCA Freeway LF Water - MN

Enclosed are the analytical results for the samples received by the laboratory on 06/05/2019.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. These results are in compliance with the 2009 NELAC Standards and the appropriate agencies listed below, unless otherwise noted in the case narrative. This analytical report should be reproduced in its entirety.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jessica Esser
Project Manager

Certification List

Certification List			Expires
DODELAP	DOD ELAP Accreditation (A2LA)	3269.01	03/31/2020
ILEPA	Illinois Secondary NELAP Accreditation	004366	04/30/2020
KDHE	Kansas Secondary NELAP Accreditation	E-10384	04/30/2020
LELAP	Louisiana Primary NELAP Accreditation	04165	06/30/2019
NCDEQ	North Carolina Dept. of Environmental Quality Accreditation	688	12/31/2019
NJDEP	New Jersey Secondary NELAP Accreditation	WI004	06/30/2019
ODEQ	Oklahoma Department of Environmental Quality Accreditation	2018-087	08/31/2019
TCEQ	Texas Secondary NELAP Accreditation	T104704504-16-7	11/30/2019
WDNR	Wisconsin Certification under NR 149	113289110	08/31/2019

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10477453
Project Manager: Jennifer Anderson

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FB-3	A192308-01	Water	06/03/2019	06/05/2019
603282	A192308-02	Water	06/03/2019	06/05/2019
M-3	A192308-03	Water	06/03/2019	06/05/2019

CASE NARRATIVE

Sample Receipt Information:

3 samples were received on 06/05/2019. Samples were received at 1.9 degrees Celsius. Samples were received in acceptable condition.

Please see the chain of custody (COC) document at the end of this report for additional information.

Laboratory Control Samples (LCS):

The E1 footnote on samples A192308-01 through A192308-03 indicates that there were quality control sample exceedances for bentazon. The LCS and LCS duplicate recoveries were below acceptable limits. Please see the quality control section of the report for more information.

The LCS or LCS duplicate recoveries indicate a potential high bias for desethylatrazine, ethalfluralin, fonofos, propachlor and triallate for samples A192308-01 through A192308-03. Samples were less than the reporting limit for these analytes so no further action is required.

Continuing Calibration Verification (CCV):

CCV indicates a potential high bias for bentazon for samples A192308-01 through A192308-03. Samples were less than the reporting limit for this analyte so no further action is required.

Pace Analytical
1700 Elm Street, Suite 202
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10477453
Project Manager: Jennifer Anderson

FB-3

A192308-01 (Water)

Date Sampled
06/03/2019 13:50

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906179

Acetochlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
EPTC	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Phorate	ND	0.30	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Prometon	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Propazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Simazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Triallate	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 09:34	EPA 8270D	
Surrogate: Atrazine-d5		89.2 %		56.9-123	06/06/2019	06/08/2019 09:34	EPA 8270D	
Surrogate: Parathion-d10		350 %		23.8-169	06/06/2019	06/08/2019 09:34	EPA 8270D	S
Surrogate: Triphenyl phosphate		104 %		50.5-178	06/06/2019	06/08/2019 09:34	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906185

2,4-D	ND	0.50	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	E1
Dicamba	ND	0.50	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/10/2019	06/13/2019 02:26	EPA 8151A	
Surrogate: 2,4-D-d5		67.6 %		43.1-133	06/10/2019	06/13/2019 02:26	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10477453
Project Manager: Jennifer Anderson

603282

A192308-02 (Water)

Date Sampled

06/03/2019 15:30

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906179

Acetochlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
EPTC	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Phorate	ND	0.30	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Prometon	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Propazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Simazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Triallate	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:02	EPA 8270D	
Surrogate: Atrazine-d5		87.6 %		56.9-123	06/06/2019	06/08/2019 10:02	EPA 8270D	
Surrogate: Parathion-d10		194 %		23.8-169	06/06/2019	06/08/2019 10:02	EPA 8270D	S
Surrogate: Triphenyl phosphate		98.5 %		50.5-178	06/06/2019	06/08/2019 10:02	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906185

2,4-D	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	E1
Dicamba	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:02	EPA 8151A	
Surrogate: 2,4-D-d5		75.7 %		43.1-133	06/10/2019	06/13/2019 03:02	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10477453
Project Manager: Jennifer Anderson

M-3
A192308-03 (Water)

Date Sampled
06/03/2019 15:35

Analyte	Result	Reporting Limit	Units	Dilution	Prepared	Analyzed	Method	Qualifiers
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Pace Analytical - Madison

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906179

Acetochlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Alachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Atrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Chlorpyrifos	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Cyanazine	ND	0.20	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Desethylatrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Deisopropylatrazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Dimethenamid	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
EPTC	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Ethalfuralin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Fonofos	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Metolachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Metribuzin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Pendimethalin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Phorate	ND	0.30	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Prometon	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Propachlor	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Propazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Simazine	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Terbufos	ND	0.20	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Triallate	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Trifluralin	ND	0.50	ug/L	1	06/06/2019	06/08/2019 10:29	EPA 8270D	
Surrogate: Atrazine-d5		90.8 %		56.9-123	06/06/2019	06/08/2019 10:29	EPA 8270D	
Surrogate: Parathion-d10		158 %		23.8-169	06/06/2019	06/08/2019 10:29	EPA 8270D	
Surrogate: Triphenyl phosphate		108 %		50.5-178	06/06/2019	06/08/2019 10:29	EPA 8270D	

Acid Herbicides by Gas Chromatography/Mass Spectrometry

Preparation Batch: A906185

2,4-D	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	
2,4-DB	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	
2,4,5-T	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	
2,4,5-TP (Silvex)	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	
Bentazon	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	E1
Dicamba	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	
MCPA	ND	0.30	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	
Picloram	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	
Triclopyr	ND	0.50	ug/L	1	06/10/2019	06/13/2019 03:37	EPA 8151A	
Surrogate: 2,4-D-d5		75.9 %		43.1-133	06/10/2019	06/13/2019 03:37	EPA 8151A	

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10477453
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A906179 - EPA 3510C

Blank (A906179-BLK1)

Prepared: 06/06/2019 Analyzed: 06/08/2019 17:05

Acetochlor	ND	0.50	ug/L							
Alachlor	ND	0.50	ug/L							
Atrazine	ND	0.50	ug/L							
Chlorpyrifos	ND	0.50	ug/L							
Cyanazine	ND	0.20	ug/L							
Desethylatrazine	ND	0.50	ug/L							
Deisopropylatrazine	ND	0.50	ug/L							
Dimethenamid	ND	0.50	ug/L							
EPTC	ND	0.50	ug/L							
Ethalfuralin	ND	0.50	ug/L							
Fonofos	ND	0.50	ug/L							
Metolachlor	ND	0.50	ug/L							
Metribuzin	ND	0.50	ug/L							
Pendimethalin	ND	0.50	ug/L							
Phorate	ND	0.30	ug/L							
Prometon	ND	0.50	ug/L							
Propachlor	ND	0.50	ug/L							
Propazine	ND	0.50	ug/L							
Simazine	ND	0.50	ug/L							
Terbufos	ND	0.20	ug/L							
Triallate	ND	0.50	ug/L							
Trifluralin	ND	0.50	ug/L							
<i>Surrogate: Atrazine-d5</i>	<i>0.434</i>		<i>ug/L</i>	<i>0.5250</i>		<i>82.7</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>1.16</i>		<i>ug/L</i>	<i>0.5445</i>		<i>214</i>	<i>23.8-169</i>			<i>S</i>
<i>Surrogate: Triphenyl phosphate</i>	<i>0.553</i>		<i>ug/L</i>	<i>0.5000</i>		<i>111</i>	<i>50.5-178</i>			

LCS (A906179-BS1)

Prepared: 06/06/2019 Analyzed: 06/08/2019 19:55

Acetochlor	1.03	0.50	ug/L	1.000		103	67.8-122			
Alachlor	1.08	0.50	ug/L	1.000		108	68.6-119			
Atrazine	1.12	0.50	ug/L	1.000		112	68.6-115			
Chlorpyrifos	1.11	0.50	ug/L	1.000		111	63.1-120			
Cyanazine	1.15	0.20	ug/L	1.000		115	55.3-143			
Desethylatrazine	1.12	0.50	ug/L	1.000		112	67.8-115			
Deisopropylatrazine	0.902	0.50	ug/L	1.000		90.2	50.1-100			
Dimethenamid	1.08	0.50	ug/L	1.000		108	70.3-121			
EPTC	0.879	0.50	ug/L	1.000		87.9	50.4-101			
Ethalfuralin	2.46	0.50	ug/L	1.000		246	42.6-121			
Fonofos	2.46	0.50	ug/L	1.000		246	56.6-119			
Metolachlor	1.15	0.50	ug/L	1.000		115	71.3-128			
Metribuzin	1.04	0.50	ug/L	1.000		104	64.9-120			
Pendimethalin	1.07	0.50	ug/L	1.000		107	60.9-128			
Phorate	0.822	0.30	ug/L	1.000		82.2	37.3-112			
Prometon	1.06	0.50	ug/L	1.000		106	67.1-120			
Propachlor	2.69	0.50	ug/L	1.000		269	66.2-127			
Propazine	1.05	0.50	ug/L	1.000		105	68.2-118			
Simazine	1.08	0.50	ug/L	1.000		108	67.2-117			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10477453
Project Manager: Jennifer Anderson

Base Neutral Pesticides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A906179 - EPA 3510C

LCS (A906179-BS1)

Prepared: 06/06/2019 Analyzed: 06/08/2019 19:55

Terbufos	0.643	0.20	ug/L	1.000		64.3	34.3-111			
Triallate	2.63	0.50	ug/L	1.000		263	53-121			
Trifluralin	0.954	0.50	ug/L	1.000		95.4	45.9-116			
<i>Surrogate: Atrazine-d5</i>	<i>0.475</i>		<i>ug/L</i>	<i>0.5250</i>		<i>90.5</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>1.35</i>		<i>ug/L</i>	<i>0.5445</i>		<i>247</i>	<i>23.8-169</i>			<i>S</i>
<i>Surrogate: Triphenyl phosphate</i>	<i>0.550</i>		<i>ug/L</i>	<i>0.5000</i>		<i>110</i>	<i>50.5-178</i>			

LCS Dup (A906179-BS1)

Prepared: 06/06/2019 Analyzed: 06/08/2019 20:23

Acetochlor	1.07	0.50	ug/L	1.000		107	67.8-122	3.44	20	
Alachlor	1.09	0.50	ug/L	1.000		109	68.6-119	0.900	20	
Atrazine	1.10	0.50	ug/L	1.000		110	68.6-115	1.93	20	
Chlorpyrifos	1.14	0.50	ug/L	1.000		114	63.1-120	2.73	20	
Cyanazine	1.16	0.20	ug/L	1.000		116	55.3-143	0.695	20	
Desethylatrazine	1.16	0.50	ug/L	1.000		116	67.8-115	3.37	20	
Deisopropylatrazine	0.721	0.50	ug/L	1.000		72.1	50.1-100	22.3	20	X
Dimethenamid	1.12	0.50	ug/L	1.000		112	70.3-121	4.27	20	
EPTC	0.892	0.50	ug/L	1.000		89.2	50.4-101	1.46	20	
Ethalfuralin	3.25	0.50	ug/L	1.000		325	42.6-121	27.4	20	X
Fonofos	3.42	0.50	ug/L	1.000		342	56.6-119	32.5	20	X
Metolachlor	1.19	0.50	ug/L	1.000		119	71.3-128	3.11	20	
Metribuzin	1.06	0.50	ug/L	1.000		106	64.9-120	1.77	20	
Pendimethalin	1.10	0.50	ug/L	1.000		110	60.9-128	2.73	20	
Phorate	0.926	0.30	ug/L	1.000		92.6	37.3-112	11.9	20	
Prometon	1.11	0.50	ug/L	1.000		111	67.1-120	4.50	20	
Propachlor	3.74	0.50	ug/L	1.000		374	66.2-127	32.5	20	X
Propazine	1.09	0.50	ug/L	1.000		109	68.2-118	4.00	20	
Simazine	1.14	0.50	ug/L	1.000		114	67.2-117	5.28	20	
Terbufos	0.643	0.20	ug/L	1.000		64.3	34.3-111	0.0622	20	
Triallate	3.50	0.50	ug/L	1.000		350	53-121	28.1	20	X
Trifluralin	0.986	0.50	ug/L	1.000		98.6	45.9-116	3.33	20	
<i>Surrogate: Atrazine-d5</i>	<i>0.506</i>		<i>ug/L</i>	<i>0.5250</i>		<i>96.4</i>	<i>56.9-123</i>			
<i>Surrogate: Parathion-d10</i>	<i>1.74</i>		<i>ug/L</i>	<i>0.5445</i>		<i>319</i>	<i>23.8-169</i>			<i>S</i>
<i>Surrogate: Triphenyl phosphate</i>	<i>0.569</i>		<i>ug/L</i>	<i>0.5000</i>		<i>114</i>	<i>50.5-178</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10477453
Project Manager: Jennifer Anderson

Acid Herbicides by Gas Chromatography/Mass Spectrometry - Quality Control

Pace Analytical - Madison

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch A906185 - EPA 3510C

Blank (A906185-BLK1)

Prepared: 06/10/2019 Analyzed: 06/13/2019 01:50

2,4-D	ND	0.50	ug/L							
2,4-DB	ND	0.50	ug/L							
2,4,5-T	ND	0.50	ug/L							
2,4,5-TP (Silvex)	ND	0.50	ug/L							
Bentazon	ND	0.50	ug/L							
Dicamba	ND	0.50	ug/L							
MCPA	ND	0.30	ug/L							
Picloram	ND	0.50	ug/L							
Triclopyr	ND	0.50	ug/L							
<i>Surrogate: 2,4-D-d5</i>	<i>1.54</i>		<i>ug/L</i>	<i>2.006</i>		<i>76.8</i>	<i>43.1-133</i>			

LCS (A906185-BS1)

Prepared: 06/10/2019 Analyzed: 06/13/2019 05:23

2,4-D	1.63	0.50	ug/L	2.000		81.3	51.7-152			
2,4-DB	1.87	0.50	ug/L	2.000		93.6	51.5-146			
2,4,5-T	1.81	0.50	ug/L	2.000		90.5	55.4-138			
2,4,5-TP (Silvex)	1.77	0.50	ug/L	2.000		88.7	47.2-152			
Bentazon	0.0991	0.50	ug/L	1.000		9.91	48.9-146			
Dicamba	1.64	0.50	ug/L	2.000		81.9	41-149			
MCPA	0.954	0.30	ug/L	2.000		47.7	32.6-148			
Picloram	0.822	0.50	ug/L	1.000		82.2	37.8-121			
Triclopyr	1.65	0.50	ug/L	2.000		82.7	49.9-149			
<i>Surrogate: 2,4-D-d5</i>	<i>1.49</i>		<i>ug/L</i>	<i>2.006</i>		<i>74.2</i>	<i>43.1-133</i>			

LCS Dup (A906185-BSD1)

Prepared: 06/10/2019 Analyzed: 06/13/2019 05:58

2,4-D	2.00	0.50	ug/L	2.000		100	51.7-152	20.8	20	X
2,4-DB	2.13	0.50	ug/L	2.000		107	51.5-146	13.1	20	
2,4,5-T	1.92	0.50	ug/L	2.000		95.9	55.4-138	5.80	20	
2,4,5-TP (Silvex)	1.94	0.50	ug/L	2.000		97.0	47.2-152	8.97	20	
Bentazon	0.131	0.50	ug/L	1.000		13.1	48.9-146	27.6	20	X
Dicamba	1.87	0.50	ug/L	2.000		93.3	41-149	13.1	20	
MCPA	0.991	0.30	ug/L	2.000		49.6	32.6-148	3.77	20	
Picloram	0.844	0.50	ug/L	1.000		84.4	37.8-121	2.62	20	
Triclopyr	1.93	0.50	ug/L	2.000		96.4	49.9-149	15.3	20	
<i>Surrogate: 2,4-D-d5</i>	<i>1.66</i>		<i>ug/L</i>	<i>2.006</i>		<i>82.8</i>	<i>43.1-133</i>			

Pace Analytical
1700 Elm Street, Suite 200
Minneapolis MN, 55414

Project: MPCA Freeway LF Water - MN
Project Number: 10477453
Project Manager: Jennifer Anderson

Notes and Definitions

- X Precision for the matrix spike duplicate, laboratory control sample duplicate or lab duplicate was outside of control limits.
- S Surrogate recovery was outside of laboratory control limits due to an apparent matrix effect.
- E1 Estimated value because of quality control sample exceedances.
- ND Analyte NOT DETECTED at or above the reporting limit or limit of detection (if listed).
- NR Not Reported
- dry Sample results reported on a dry weight basis. If the word 'dry' does not appear after the units, results are reported on an as-is basis.
- RPD Relative Percent Difference

May 29, 2019

Mr. Brad Jacobson
Pace Analytical Services, LLC..
1700 Elm Street
Suite 200
Minneapolis, MN 55414

RE: Project: PRJ07786 19-01567 MPCA Freeway-Revised Report
Pace Project No.: 10469120

Dear Mr. Jacobson:

Enclosed are the analytical results for sample(s) received by the laboratory on April 01, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on May 29, 2019, to convert TO15 reporting units from ppbv into $\mu\text{g}/\text{m}^3$.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Nathan Boberg
nathan.boberg@pacelabs.com
(612)360-0728
Project Manager

Enclosures

cc: Pace Analytical - Field, Pace Analytical Field Services
Mr. Terry Borgerding, PASI Minnesota Field
Mr. Tom Halverson, Pace Analytical Minnesota



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Certification #: via MN 027-053-137

Minnesota Petrofund Certification #: 1240

Mississippi Certification #: MN00064

Missouri Certification #: 10100

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Primary Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Vermont Certification #: VT-027053137

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DEP Certification #: 382

West Virginia DW Certification #: 9952 C

Wisconsin Certification #: 999407970

Wyoming UST Certification #: via A2LA 2926.01

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10469120001	FD-SB-07	Air	04/01/19 13:45	04/01/19 16:20
10469120002	FD-SB-08	Air	04/01/19 15:23	04/01/19 16:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10469120001	FD-SB-07	TO-3 Air	CH1	1
10469120002	FD-SB-08	TO-3 Air	CH1	1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

Sample: FD-SB-07	Lab ID: 10469120001	Collected: 04/01/19 13:45	Received: 04/01/19 16:20	Matrix: Air				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO3 GCV AIR Meth,Ethane,Ethene								
Analytical Method: TO-3 Air								
Methane	45.3	ppmv	35.0	1.75		04/10/19 14:17	74-82-8	
Analytical Method: TO-15								
Acetone	300	ug/m3	4.4	1.83		04/18/19 21:36	67-64-1	
Benzene	1.9	ug/m3	0.59	1.83		04/18/19 21:36	71-43-2	
Benzyl chloride	ND	ug/m3	4.8	1.83		04/18/19 21:36	100-44-7	
Bromodichloromethane	ND	ug/m3	2.5	1.83		04/18/19 21:36	75-27-4	
Bromoform	ND	ug/m3	9.6	1.83		04/18/19 21:36	75-25-2	
Bromomethane	ND	ug/m3	1.4	1.83		04/18/19 21:36	74-83-9	
1,3-Butadiene	ND	ug/m3	0.82	1.83		04/18/19 21:36	106-99-0	
2-Butanone (MEK)	16.2	ug/m3	5.5	1.83		04/18/19 21:36	78-93-3	
Carbon disulfide	ND	ug/m3	1.2	1.83		04/18/19 21:36	75-15-0	
Carbon tetrachloride	ND	ug/m3	2.3	1.83		04/18/19 21:36	56-23-5	
Chlorobenzene	ND	ug/m3	1.7	1.83		04/18/19 21:36	108-90-7	
Chloroethane	ND	ug/m3	0.98	1.83		04/18/19 21:36	75-00-3	
Chloroform	ND	ug/m3	0.91	1.83		04/18/19 21:36	67-66-3	
Chloromethane	ND	ug/m3	0.77	1.83		04/18/19 21:36	74-87-3	
Cyclohexane	ND	ug/m3	3.2	1.83		04/18/19 21:36	110-82-7	
Dibromochloromethane	ND	ug/m3	3.2	1.83		04/18/19 21:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	1.4	1.83		04/18/19 21:36	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.2	1.83		04/18/19 21:36	95-50-1	
1,3-Dichlorobenzene	5.1	ug/m3	2.2	1.83		04/18/19 21:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	5.6	1.83		04/18/19 21:36	106-46-7	
Dichlorodifluoromethane	10.1	ug/m3	1.8	1.83		04/18/19 21:36	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.5	1.83		04/18/19 21:36	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.75	1.83		04/18/19 21:36	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.5	1.83		04/18/19 21:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.5	1.83		04/18/19 21:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.5	1.83		04/18/19 21:36	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.7	1.83		04/18/19 21:36	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.7	1.83		04/18/19 21:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.7	1.83		04/18/19 21:36	10061-02-6	
Dichlorotetrafluoroethane	15.8	ug/m3	2.6	1.83		04/18/19 21:36	76-14-2	
Ethanol	33.5	ug/m3	3.5	1.83		04/18/19 21:36	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	1.83		04/18/19 21:36	141-78-6	
Ethylbenzene	4.4	ug/m3	1.6	1.83		04/18/19 21:36	100-41-4	
4-Ethyltoluene	ND	ug/m3	4.6	1.83		04/18/19 21:36	622-96-8	
n-Heptane	3.5	ug/m3	1.5	1.83		04/18/19 21:36	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	9.9	1.83		04/18/19 21:36	87-68-3	
n-Hexane	3.4	ug/m3	1.3	1.83		04/18/19 21:36	110-54-3	
2-Hexanone	ND	ug/m3	7.6	1.83		04/18/19 21:36	591-78-6	
Methylene Chloride	ND	ug/m3	6.5	1.83		04/18/19 21:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.6	1.83		04/18/19 21:36	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.7	1.83		04/18/19 21:36	1634-04-4	
Naphthalene	ND	ug/m3	4.9	1.83		04/18/19 21:36	91-20-3	
2-Propanol	6.7	ug/m3	4.6	1.83		04/18/19 21:36	67-63-0	
Propylene	10.9	ug/m3	0.64	1.83		04/18/19 21:36	115-07-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

Sample: FD-SB-07		Lab ID: 10469120001	Collected: 04/01/19 13:45	Received: 04/01/19 16:20	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical Method: TO-15								
Styrene	ND	ug/m3	1.6	1.83		04/18/19 21:36	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.3	1.83		04/18/19 21:36	79-34-5	
Tetrachloroethene	18.8	ug/m3	1.3	1.83		04/18/19 21:36	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.1	1.83		04/18/19 21:36	109-99-9	
Toluene	16.3	ug/m3	1.4	1.83		04/18/19 21:36	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	13.8	1.83		04/18/19 21:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.0	1.83		04/18/19 21:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.0	1.83		04/18/19 21:36	79-00-5	
Trichloroethene	ND	ug/m3	1.0	1.83		04/18/19 21:36	79-01-6	
Trichlorofluoromethane	11.5	ug/m3	2.1	1.83		04/18/19 21:36	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.9	1.83		04/18/19 21:36	76-13-1	
1,2,4-Trimethylbenzene	6.8	ug/m3	1.8	1.83		04/18/19 21:36	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.8	1.83		04/18/19 21:36	108-67-8	
Vinyl acetate	ND	ug/m3	1.3	1.83		04/18/19 21:36	108-05-4	
Vinyl chloride	ND	ug/m3	0.48	1.83		04/18/19 21:36	75-01-4	
m&p-Xylene	17.5	ug/m3	3.2	1.83		04/18/19 21:36	179601-23-1	
o-Xylene	6.0	ug/m3	1.6	1.83		04/18/19 21:36	95-47-6	

Sample: FD-SB-08		Lab ID: 10469120002	Collected: 04/01/19 15:23	Received: 04/01/19 16:20	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO3 GCV AIR Meth,Ethane,Ethene		Analytical Method: TO-3 Air						
Methane	ND	ppmv	36.6	1.83		04/10/19 14:26	74-82-8	
Analytical Method: TO-15								
Acetone	159	ug/m3	4.2	1.75		04/18/19 22:03	67-64-1	
Benzene	5.2	ug/m3	0.57	1.75		04/18/19 22:03	71-43-2	
Benzyl chloride	ND	ug/m3	4.6	1.75		04/18/19 22:03	100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	1.75		04/18/19 22:03	75-27-4	
Bromoform	ND	ug/m3	9.2	1.75		04/18/19 22:03	75-25-2	
Bromomethane	ND	ug/m3	1.4	1.75		04/18/19 22:03	74-83-9	
1,3-Butadiene	ND	ug/m3	0.79	1.75		04/18/19 22:03	106-99-0	
2-Butanone (MEK)	ND	ug/m3	5.2	1.75		04/18/19 22:03	78-93-3	
Carbon disulfide	34.6	ug/m3	1.1	1.75		04/18/19 22:03	75-15-0	
Carbon tetrachloride	ND	ug/m3	2.2	1.75		04/18/19 22:03	56-23-5	
Chlorobenzene	ND	ug/m3	1.6	1.75		04/18/19 22:03	108-90-7	
Chloroethane	ND	ug/m3	0.94	1.75		04/18/19 22:03	75-00-3	
Chloroform	ND	ug/m3	0.87	1.75		04/18/19 22:03	67-66-3	
Chloromethane	6.1	ug/m3	0.74	1.75		04/18/19 22:03	74-87-3	
Cyclohexane	ND	ug/m3	3.1	1.75		04/18/19 22:03	110-82-7	
Dibromochloromethane	ND	ug/m3	3.0	1.75		04/18/19 22:03	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	1.4	1.75		04/18/19 22:03	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.1	1.75		04/18/19 22:03	95-50-1	
1,3-Dichlorobenzene	3.2	ug/m3	2.1	1.75		04/18/19 22:03	541-73-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

Sample: FD-SB-08	Lab ID: 10469120002	Collected: 04/01/19 15:23	Received: 04/01/19 16:20	Matrix: Air				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Analytical Method: TO-15								
1,4-Dichlorobenzene	ND	ug/m3	5.4	1.75		04/18/19 22:03	106-46-7	
Dichlorodifluoromethane	65.8	ug/m3	1.8	1.75		04/18/19 22:03	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.4	1.75		04/18/19 22:03	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.72	1.75		04/18/19 22:03	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.4	1.75		04/18/19 22:03	75-35-4	
cis-1,2-Dichloroethene	16.1	ug/m3	1.4	1.75		04/18/19 22:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	1.75		04/18/19 22:03	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.6	1.75		04/18/19 22:03	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	1.75		04/18/19 22:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	1.75		04/18/19 22:03	10061-02-6	
Dichlorotetrafluoroethane	77.1	ug/m3	2.5	1.75		04/18/19 22:03	76-14-2	
Ethanol	7.1	ug/m3	3.4	1.75		04/18/19 22:03	64-17-5	
Ethyl acetate	ND	ug/m3	1.3	1.75		04/18/19 22:03	141-78-6	
Ethylbenzene	4.4	ug/m3	1.5	1.75		04/18/19 22:03	100-41-4	
4-Ethyltoluene	ND	ug/m3	4.4	1.75		04/18/19 22:03	622-96-8	
n-Heptane	66.3	ug/m3	1.5	1.75		04/18/19 22:03	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	9.5	1.75		04/18/19 22:03	87-68-3	
n-Hexane	180	ug/m3	1.3	1.75		04/18/19 22:03	110-54-3	
2-Hexanone	ND	ug/m3	7.3	1.75		04/18/19 22:03	591-78-6	
Methylene Chloride	ND	ug/m3	6.2	1.75		04/18/19 22:03	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.3	1.75		04/18/19 22:03	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	6.4	1.75		04/18/19 22:03	1634-04-4	
Naphthalene	ND	ug/m3	4.7	1.75		04/18/19 22:03	91-20-3	
2-Propanol	ND	ug/m3	4.4	1.75		04/18/19 22:03	67-63-0	
Propylene	310	ug/m3	0.61	1.75		04/18/19 22:03	115-07-1	E
Styrene	ND	ug/m3	1.5	1.75		04/18/19 22:03	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.2	1.75		04/18/19 22:03	79-34-5	
Tetrachloroethene	34.9	ug/m3	1.2	1.75		04/18/19 22:03	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.0	1.75		04/18/19 22:03	109-99-9	
Toluene	17.0	ug/m3	1.3	1.75		04/18/19 22:03	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	13.2	1.75		04/18/19 22:03	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.9	1.75		04/18/19 22:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.97	1.75		04/18/19 22:03	79-00-5	
Trichloroethene	35.5	ug/m3	0.96	1.75		04/18/19 22:03	79-01-6	
Trichlorofluoromethane	ND	ug/m3	2.0	1.75		04/18/19 22:03	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.7	1.75		04/18/19 22:03	76-13-1	
1,2,4-Trimethylbenzene	7.7	ug/m3	1.7	1.75		04/18/19 22:03	95-63-6	
1,3,5-Trimethylbenzene	2.1	ug/m3	1.7	1.75		04/18/19 22:03	108-67-8	
Vinyl acetate	ND	ug/m3	1.3	1.75		04/18/19 22:03	108-05-4	
Vinyl chloride	1.2	ug/m3	0.46	1.75		04/18/19 22:03	75-01-4	
m&p-Xylene	15.7	ug/m3	3.1	1.75		04/18/19 22:03	179601-23-1	
o-Xylene	5.5	ug/m3	1.5	1.75		04/18/19 22:03	95-47-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

QC Batch: 608611 Analysis Method: TO-15
QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10469120001, 10469120002

METHOD BLANK: 3289774 Matrix: Air

Associated Lab Samples: 10469120001, 10469120002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	0.56	04/18/19 12:44	
1,1,2,2-Tetrachloroethane	ug/m3	ND	0.35	04/18/19 12:44	
1,1,2-Trichloroethane	ug/m3	ND	0.28	04/18/19 12:44	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	0.78	04/18/19 12:44	
1,1-Dichloroethane	ug/m3	ND	0.41	04/18/19 12:44	
1,1-Dichloroethene	ug/m3	ND	0.40	04/18/19 12:44	
1,2,4-Trichlorobenzene	ug/m3	ND	3.8	04/18/19 12:44	
1,2,4-Trimethylbenzene	ug/m3	ND	0.50	04/18/19 12:44	
1,2-Dibromoethane (EDB)	ug/m3	ND	0.39	04/18/19 12:44	
1,2-Dichlorobenzene	ug/m3	ND	0.61	04/18/19 12:44	
1,2-Dichloroethane	ug/m3	ND	0.21	04/18/19 12:44	
1,2-Dichloropropane	ug/m3	ND	0.47	04/18/19 12:44	
1,3,5-Trimethylbenzene	ug/m3	ND	0.50	04/18/19 12:44	
1,3-Butadiene	ug/m3	ND	0.22	04/18/19 12:44	
1,3-Dichlorobenzene	ug/m3	ND	0.61	04/18/19 12:44	
1,4-Dichlorobenzene	ug/m3	ND	1.5	04/18/19 12:44	
2-Butanone (MEK)	ug/m3	ND	1.5	04/18/19 12:44	
2-Hexanone	ug/m3	ND	2.1	04/18/19 12:44	
2-Propanol	ug/m3	ND	1.2	04/18/19 12:44	
4-Ethyltoluene	ug/m3	ND	1.2	04/18/19 12:44	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	2.1	04/18/19 12:44	
Acetone	ug/m3	ND	1.2	04/18/19 12:44	
Benzene	ug/m3	ND	0.16	04/18/19 12:44	
Benzyl chloride	ug/m3	ND	1.3	04/18/19 12:44	
Bromodichloromethane	ug/m3	ND	0.68	04/18/19 12:44	
Bromoform	ug/m3	ND	2.6	04/18/19 12:44	
Bromomethane	ug/m3	ND	0.39	04/18/19 12:44	
Carbon disulfide	ug/m3	ND	0.32	04/18/19 12:44	
Carbon tetrachloride	ug/m3	ND	0.64	04/18/19 12:44	
Chlorobenzene	ug/m3	ND	0.47	04/18/19 12:44	
Chloroethane	ug/m3	ND	0.27	04/18/19 12:44	
Chloroform	ug/m3	ND	0.25	04/18/19 12:44	
Chloromethane	ug/m3	ND	0.21	04/18/19 12:44	
cis-1,2-Dichloroethene	ug/m3	ND	0.40	04/18/19 12:44	
cis-1,3-Dichloropropene	ug/m3	ND	0.46	04/18/19 12:44	
Cyclohexane	ug/m3	ND	0.88	04/18/19 12:44	
Dibromochloromethane	ug/m3	ND	0.86	04/18/19 12:44	
Dichlorodifluoromethane	ug/m3	ND	0.50	04/18/19 12:44	
Dichlorotetrafluoroethane	ug/m3	ND	0.71	04/18/19 12:44	
Ethanol	ug/m3	ND	0.96	04/18/19 12:44	
Ethyl acetate	ug/m3	ND	0.37	04/18/19 12:44	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

METHOD BLANK: 3289774

Matrix: Air

Associated Lab Samples: 10469120001, 10469120002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylbenzene	ug/m3	ND	0.44	04/18/19 12:44	
Hexachloro-1,3-butadiene	ug/m3	ND	2.7	04/18/19 12:44	
m&p-Xylene	ug/m3	ND	0.88	04/18/19 12:44	
Methyl-tert-butyl ether	ug/m3	ND	1.8	04/18/19 12:44	
Methylene Chloride	ug/m3	ND	1.8	04/18/19 12:44	
n-Heptane	ug/m3	ND	0.42	04/18/19 12:44	
n-Hexane	ug/m3	ND	0.36	04/18/19 12:44	
Naphthalene	ug/m3	ND	1.3	04/18/19 12:44	
o-Xylene	ug/m3	ND	0.44	04/18/19 12:44	
Propylene	ug/m3	ND	0.18	04/18/19 12:44	
Styrene	ug/m3	ND	0.43	04/18/19 12:44	
Tetrachloroethene	ug/m3	ND	0.34	04/18/19 12:44	
Tetrahydrofuran	ug/m3	ND	0.30	04/18/19 12:44	
Toluene	ug/m3	ND	0.38	04/18/19 12:44	
trans-1,2-Dichloroethene	ug/m3	ND	0.40	04/18/19 12:44	
trans-1,3-Dichloropropene	ug/m3	ND	0.46	04/18/19 12:44	
Trichloroethene	ug/m3	ND	0.27	04/18/19 12:44	
Trichlorofluoromethane	ug/m3	ND	0.57	04/18/19 12:44	
Vinyl acetate	ug/m3	ND	0.36	04/18/19 12:44	
Vinyl chloride	ug/m3	ND	0.13	04/18/19 12:44	

LABORATORY CONTROL SAMPLE: 3289775

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	56.6	50.6	89	70-130	
1,1,2,2-Tetrachloroethane	ug/m3	69.8	63.6	91	70-132	
1,1,2-Trichloroethane	ug/m3	58.2	52.0	89	70-130	
1,1,2-Trichlorotrifluoroethane	ug/m3	84.9	73.1	86	70-130	
1,1-Dichloroethane	ug/m3	42.4	39.3	93	70-130	
1,1-Dichloroethene	ug/m3	43.5	36.4	84	70-130	
1,2,4-Trichlorobenzene	ug/m3	74.7	62.8	84	56-130	
1,2,4-Trimethylbenzene	ug/m3	53	45.3	86	70-134	
1,2-Dibromoethane (EDB)	ug/m3	83.6	71.6	86	70-130	
1,2-Dichlorobenzene	ug/m3	59.9	55.9	93	70-132	
1,2-Dichloroethane	ug/m3	42.8	39.3	92	70-130	
1,2-Dichloropropane	ug/m3	48.4	42.4	88	70-130	
1,3,5-Trimethylbenzene	ug/m3	53.5	44.1	82	70-132	
1,3-Butadiene	ug/m3	22.5	20.6	91	65-130	
1,3-Dichlorobenzene	ug/m3	65.4	56.2	86	70-137	
1,4-Dichlorobenzene	ug/m3	65.4	57.2	87	70-134	
2-Butanone (MEK)	ug/m3	32.4	25.2	78	70-130	
2-Hexanone	ug/m3	42.9	38.1	89	70-135	
2-Propanol	ug/m3	26.5	26.6	101	68-130	
4-Ethyltoluene	ug/m3	52	46.2	89	70-138	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

LABORATORY CONTROL SAMPLE: 3289775

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4-Methyl-2-pentanone (MIBK)	ug/m3	42	38.6	92	70-131	
Acetone	ug/m3	26.6	22.1	83	67-130	
Benzene	ug/m3	34.4	33.2	96	70-130	
Benzyl chloride	ug/m3	56.3	47.5	84	70-130	
Bromodichloromethane	ug/m3	69.5	61.3	88	70-130	
Bromoform	ug/m3	97.7	80.0	82	70-132	
Bromomethane	ug/m3	40.6	35.0	86	69-130	
Carbon disulfide	ug/m3	32.9	29.5	90	56-137	
Carbon tetrachloride	ug/m3	65.9	46.7	71	66-131	
Chlorobenzene	ug/m3	49.6	41.0	83	70-130	
Chloroethane	ug/m3	26.8	27.4	102	70-130	
Chloroform	ug/m3	52.6	50.5	96	70-130	
Chloromethane	ug/m3	22.2	18.2	82	66-130	
cis-1,2-Dichloroethene	ug/m3	41.9	37.4	89	70-130	
cis-1,3-Dichloropropene	ug/m3	48	38.5	80	70-133	
Cyclohexane	ug/m3	35.3	32.0	90	68-132	
Dibromochloromethane	ug/m3	90	71.7	80	70-130	
Dichlorodifluoromethane	ug/m3	52.8	44.1	83	70-130	
Dichlorotetrafluoroethane	ug/m3	74.6	66.5	89	70-130	
Ethanol	ug/m3	21.1	20.3	96	68-133	
Ethyl acetate	ug/m3	38.8	33.6	86	69-130	
Ethylbenzene	ug/m3	45.5	39.3	87	67-131	
Hexachloro-1,3-butadiene	ug/m3	108	99.5	92	66-137	
m&p-Xylene	ug/m3	45.9	43.1	94	70-132	
Methyl-tert-butyl ether	ug/m3	37.4	33.4	89	70-130	
Methylene Chloride	ug/m3	38.1	33.6	88	65-130	
n-Heptane	ug/m3	43.7	37.0	85	65-130	
n-Hexane	ug/m3	37.6	30.6	81	66-130	
Naphthalene	ug/m3	52.7	44.8	85	56-130	
o-Xylene	ug/m3	44.1	39.4	89	70-130	
Propylene	ug/m3	19.2	15.0	78	67-130	
Styrene	ug/m3	44.2	39.8	90	69-136	
Tetrachloroethene	ug/m3	70.3	62.5	89	70-130	
Tetrahydrofuran	ug/m3	30.3	30.1	99	68-131	
Toluene	ug/m3	39.4	34.5	88	70-130	
trans-1,2-Dichloroethene	ug/m3	41.5	38.4	93	70-130	
trans-1,3-Dichloropropene	ug/m3	44.8	42.6	95	70-134	
Trichloroethene	ug/m3	56.3	50.5	90	70-130	
Trichlorofluoromethane	ug/m3	58.8	52.8	90	65-130	
Vinyl acetate	ug/m3	35.1	32.8	93	61-133	
Vinyl chloride	ug/m3	28.1	23.3	83	70-130	

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QUALITY CONTROL DATA

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

QC Batch: 598755	Analysis Method: TO-3 Air
QC Batch Method: TO-3 Air	Analysis Description: TO3 GCV AIR METH,ETHANE,ETHENE
Associated Lab Samples: 10469120001, 10469120002	

METHOD BLANK: 3237007 Matrix: Air

Associated Lab Samples: 10469120001, 10469120002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Methane	ppmv	ND	20.0	04/10/19 13:01	

LABORATORY CONTROL SAMPLE & LCSD: 3237008 3237009

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ppmv	1000	738	718	74	72	70-130	3	30	

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QUALIFIERS

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRJ07786 19-01567 MPCA Freeway-Revised Report

Pace Project No.: 10469120

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10469120001	FD-SB-07	TO-3 Air	598755		
10469120002	FD-SB-08	TO-3 Air	598755		

REPORT OF LABORATORY ANALYSIS

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Minnesota Pollution Control Agency

Chain-of-Custody Form revision 2013.0909

Work Order Number:

COC Type:

Page: 1 of 1

Turnaround Time:

COC ID:

FOR LAB USE ONLY

PROJECT/CLIENT INFO

LABORATORY

Facility Code: MNSW-057

Program Code (MDH Lab Only):

Lab Name:

Pace Analytical - Minneapolis, MN

Project Name: 19-01567 MPCA Freeway Landfill 2019 Soil Gas

Project Task Code: PRJ07786

Address: 1700 SE Elm Street

Project Manager: Brad Jacobson

612-607-6375

EPIC PROFILE #: 38716

Minneapolis

MN

55414

Potential Hazard?

If yes, add information to Sampler Comments Section

Phone No: 612-607-6400

Lab Work Order Sticker

SAMPLE DETAILS

SAMPLE TYPE CODES

Sample=Routine Sample
S-IVP=Integrated Vertical Profile Sample
S-CWOP=Composite Sample

QC-FB=Field Blank Sample
QC-FR=Field Replicate Sample
QC-TB=Trip Blank Sample

LAB MATRIX CODES

DW=Drinking Water
NW=Non-potable Water
SD=Soil/Solid
WP=Wipe

AR=Air
BL=Biological Material
OT=Other
TS=Tissue

FIELD MATRIX CODES

Wtr-Ground=Groundwater
Wtr-Surf=Surface Water
QC-BLANK=Artificial Blank Water
Leachate=Leachate Sample

Location Identifier	Sample Type	Date	Time	Start Depth, in meters	End Depth, in meters	Grab (G) or Composite (C) Sample	Lab Matrix Code	Field Matrix Code	AIS	Sampler Comments (filter volume, special handling, etc.)	# of Cont	ANALYSIS	PRESERV.	TO-15/TO-3 (See QAPP Analytical Table 3c)	Lab Sample No.	#
FD-SB-07	AR	4/1/19	1345	-	-	C	AR	AR	N	-	1			X	001	1
FD-SB-08	AR	4/1/19	1523	-	-	C	AR	AR	N	-	1			X	002	2
									N							3
									N							4
									N							5
									N							6
									N							7
									N							8
									N							9
									N							10

WO#: 10469120

10469120

Sampled By: *Chris Relesi*

Sampler's Signature: *Chris Relesi*

Phone #: 612-597-7254

Receiving Comments:

Relinquished By/Affiliation	Date/Time	Accepted By/ Affiliation	Date/Time
(Sampler) <i>Chris Relesi</i> Pace	4/1/19 / 1620	<i>[Signature]</i>	4/1/19 / 1620

WO# : 10469120

PM: NB3 Due Date: 04/08/19
 CLIENT: PAST-MNFLD-R

Air Sample Condition Upon Receipt Client Name: M.A.A Project #: _____

Courier: Fed Ex UPS USPS Client
 Pace Speedee Commercial See Exception

Tracking Number: _____

Custody Seal on Cooler/Box Present? Yes No Seals intact? Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Tin Can Other: _____ Temp Blank rec: Yes No

Temp. (TO17 and TO13 samples only) (°C): _____ Corrected Temp (°C): _____ Thermometer Used: G87A9170600254
 G87A9155100842

Temp should be above freezing to 6°C Correction Factor: _____ Date & Initials of Person Examining Contents: 04/02/19 CS

Type of ice received Blue Wet None

		Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Media: <u>Air Can</u> Airbag Filter TDT Passive		11. Individually Certified Cans Y <u>N</u> (list which samples)
Is sufficient information available to reconcile samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
Do cans need to be pressurized (3C and ASTM 1946 DO NOT PRESSURIZE)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13.

Samples Received:					Pressure Gauge # <input type="checkbox"/> 10AIR34 <input checked="" type="checkbox"/> 10AIR35				
Canisters					Canisters				
Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure	Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure
07	0679	2118	-8.0	15.0					
08	0534	1106	-7.0	"					

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____

Project Manager Review: Nathan Bobory Date: 4/3/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Table 3c
Pace Soil Gas Analyses
Freeway Landfill, Dump and Transfer Station Investigation QAPP

Parameter	Method	CAS #	Alternate Name	MDL (ppbv)	PRL (ppbv)	MW	MDL (ug/m3)	PRL (ug/m3)	LCS Lower	LCS Upper	DUP RPD
1,1,1-Trichloroethane	EPA TO15	71-55-6	--	0.0558	0.2	133.4047	0.309	1.11	70	135	25
1,1,2,2-Tetrachloroethane	EPA TO15	79-34-5	--	0.0419	0.1	167.8498	0.292	0.698	70	146	25
1,1,2-Trichloroethane	EPA TO15	79-00-5	--	0.0452	0.1	133.4047	0.250	0.555	70	135	25
1,1,2-Trichlorotrifluoroethane	EPA TO15	76-13-1	Freon 113	0.0724	0.2	187.3762	0.564	1.56	63	139	25
1,1-Dichloroethane	EPA TO15	75-34-3	--	0.0546	0.2	98.9596	0.225	0.823	70	134	25
1,1-Dichloroethene	EPA TO15	75-35-4	--	0.0679	0.2	96.9438	0.274	0.806	70	137	25
1,2,4-Trichlorobenzene	EPA TO15	120-82-1	--	0.493	1	181.4487	3.72	7.54	60	133	25
1,2,4-Trimethylbenzene	EPA TO15	95-63-6	--	0.0904	0.2	120.1938	0.452	0.999	70	137	25
1,2-Dibromoethane (EDB)	EPA TO15	106-93-4	--	0.0468	0.1	187.8616	0.366	0.781	70	140	25
1,2-Dichlorobenzene	EPA TO15	95-50-1	--	0.0814	0.2	147.0036	0.498	1.22	70	137	25
1,2-Dichloroethane	EPA TO15	107-06-2	--	0.0365	0.1	98.9596	0.150	0.411	70	136	25
1,2-Dichloropropane	EPA TO15	78-87-5	--	0.0490	0.2	112.9864	0.230	0.939	70	136	25
1,3,5-Trimethylbenzene	EPA TO15	108-67-8	--	0.0798	0.2	120.1938	0.399	0.999	70	133	25
1,3-Butadiene	EPA TO15	106-99-0	--	0.0567	0.2	54.0914	0.128	0.450	64	141	25
1,3-Dichlorobenzene	EPA TO15	541-73-1	--	0.0951	0.2	147.0036	0.581	1.22	70	137	25
1,4-Dichlorobenzene	EPA TO15	106-46-7	--	0.164	0.5	147.0036	1.00	3.06	70	134	25
2-Butanone (MEK)	EPA TO15	78-93-3	Methyl Ethyl Ketone	0.123	1	72.1057	0.369	3.00	65	143	25
2-Hexanone	EPA TO15	591-78-6	Methyl Butyl Ketone	0.179	1	100.1589	0.745	4.16	60	148	25
2-Propanol	EPA TO15	67-63-0	isopropyl alcohol	0.279	1	60.1	0.697	2.50	65	135	25
4-Ethyltoluene	EPA TO15	622-96-8	--	0.114	0.5	120.1938	0.570	2.50	70	132	25
4-Methyl-2-pentanone (MIBK)	EPA TO15	108-10-1	Methy Isobutyl Ketone	0.124	1	100.1602	0.518	4.16	70	135	25
Acetone	EPA TO15	67-64-1	--	0.499	1	58.0798	1.21	2.41	59	132	25
Benzene	EPA TO15	71-43-2	--	0.0471	0.1	78.1134	0.153	0.325	70	134	25
Benzyl chloride	EPA TO15	100-44-7	--	0.228	0.5	126.58	1.20	2.63	56	150	25
Bromodichloromethane	EPA TO15	75-27-4	--	0.0537	0.2	163.8289	0.366	1.36	70	142	25
Bromoform	EPA TO15	75-25-2	--	0.135	0.5	252.7309	1.42	5.25	69	150	25
Bromomethane	EPA TO15	74-83-9	--	0.0575	0.2	94.9387	0.227	0.789	61	141	25
Carbon disulfide	EPA TO15	75-15-0	--	0.0692	0.2	76.131	0.219	0.633	66	134	25
Carbon tetrachloride	EPA TO15	56-23-5	--	0.0671	0.2	153.823	0.429	1.28	60	145	25
Chlorobenzene	EPA TO15	108-90-7	--	0.0588	0.2	112.5585	0.275	0.936	70	130	25
Chloroethane	EPA TO15	75-00-3	--	0.0969	0.2	64.5145	0.260	0.536	65	143	25
Chloroform	EPA TO15	67-66-3	--	0.0395	0.1	119.3779	0.196	0.496	70	132	25
Chloromethane	EPA TO15	74-87-3	--	0.0742	0.2	50.4877	0.156	0.420	58	140	25
cis-1,2-Dichloroethene	EPA TO15	156-59-2	--	0.0543	0.2	96.9438	0.219	0.806	70	136	25
cis-1,3-Dichloropropene	EPA TO15	10061-01-5	--	0.0659	0.2	110.9706	0.304	0.923	70	136	25
Cyclohexane	EPA TO15	110-82-7	--	0.101	0.5	84.1608	0.353	1.75	70	133	25
Dibromochloromethane	EPA TO15	124-48-1	--	0.0830	0.2	208.2799	0.719	1.73	68	149	25
Dichlorodifluoromethane	EPA TO15	75-71-8	--	0.0584	0.2	120.9138	0.293	1.01	69	130	25
Dichlorotetrafluoroethane	EPA TO15	76-14-2	--	0.0615	0.2	170.9216	0.437	1.42	68	130	25
Ethanol	EPA TO15	64-17-5	--	0.424	1	46.07	0.812	1.92	65	146	25
Ethyl acetate	EPA TO15	141-78-6	--	0.0518	0.2	88.106	0.190	0.733	68	136	25

Table 3c
Pace Soil Gas Analyses
Freeway Landfill, Dump and Transfer Station Investigation QAPP

Ethylbenzene	EPA TO15	100-41-4	--	0.0690	0.2	106.167	0.305	0.883	70	133	25
Hexachloro-1,3-butadiene	EPA TO15	87-68-3	--	0.181	0.5	260.762	1.967	5.42	59	140	25
m&p-Xylene	EPA TO15	106-42-3	--	0.158	0.4	106.167	0.699	1.77	70	133	25
Methylene Chloride	EPA TO15	75-0902	--	0.267	1	84.9328	0.944	3.53	67	132	25
Methyl-tert-butyl ether	EPA TO15	1634-04-4	--	0.181	1	88.1492	0.663	3.66	70	132	25
Naphthalene	EPA TO15	91-20-3	--	0.248	0.5	128.1732	1.32	2.66	55	136	25
n-Heptane	EPA TO15	142-82-5	heptane	0.0913	0.2	100.2034	0.380	0.833	64	136	25
n-Hexane	EPA TO15	110-54-3	--	0.0867	0.2	86.1766	0.311	0.716	70	130	25
o-Xylene	EPA TO15	95-47-6	--	0.0780	0.2	106.167	0.344	0.883	70	132	25
Propylene	EPA TO15	115-07-1	--	0.0816	0.2	42.0804	0.143	0.350	37	150	25
Styrene	EPA TO15	100-42-5	--	0.0794	0.2	104.1512	0.344	0.866	70	139	25
Tetrachloroethene	EPA TO15	127-18-4	--	0.0455	0.1	165.834	0.314	0.689	70	133	25
Tetrahydrofuran	EPA TO15	109-99-9	--	0.0870	0.2	72.1066	0.261	0.600	62	141	25
Toluene	EPA TO15	108-88-3	--	0.0916	0.2	92.1402	0.351	0.766	70	130	25
trans-1,2-Dichloroethene	EPA TO15	156-60-5	--	0.0706	0.2	96.9438	0.285	0.806	70	132	25
trans-1,3-Dichloropropene	EPA TO15	10061-02-6	--	0.0953	0.2	110.9706	0.440	0.923	70	135	25
Trichloroethene	EPA TO15	79-01-6	--	0.0470	0.1	131.3889	0.257	0.546	70	135	25
Trichlorofluoromethane	EPA TO15	75-69-4	--	0.0641	0.2	137.3684	0.366	1.14	59	140	25
Vinyl acetate	EPA TO15	108-05-4	--	0.0754	0.2	86.0902	0.270	0.716	57	150	25
Vinyl chloride	EPA TO15	75-01-4	--	0.0485	0.1	62.4987	0.126	0.260	70	141	25
Methane (reported as %)	EPA 3C	74-82-8	--	0.94	4	--	--	--	70	130	30



Pace Analytical Services, Inc.
 1700 Elm Street – Suite 200
 Minneapolis, MN 55414
 Phone: 612.607.1700
 Fax: 612.607.6444

ANALYTICAL RESULTS

Client: PASI-MNFLD-AIR
 Phone: 864-980-5092

Lab Project Number: 10469120
 Project Name: PRJ07786 19-01567 MPCA Freew

Lab Sample No: 10469120001
 Client Sample ID: FD-SB-07

ProjSampleNum: 10469120001
 Matrix: Air

Date Collected: 04/01/19 13:45
 Date Received: 04/01/19 16:20

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
Air							
TO-15							
1,1,1-Trichloroethane	ND	ug/m3	2.1	1.83	04/18/19 21:36	MLS 71-55-6	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.3	1.83	04/18/19 21:36	MLS 79-34-5	
1,1,2-Trichloroethane	ND	ug/m3	1	1.83	04/18/19 21:36	MLS 79-00-5	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.9	1.83	04/18/19 21:36	MLS 76-13-1	
1,1-Dichloroethane	ND	ug/m3	1.5	1.83	04/18/19 21:36	MLS 75-34-3	
1,1-Dichloroethene	ND	ug/m3	1.5	1.83	04/18/19 21:36	MLS 75-35-4	
1,2,4-Trichlorobenzene	ND	ug/m3	13.6	1.83	04/18/19 21:36	MLS 120-82-1	
1,2,4-Trimethylbenzene	7	ug/m3	1.8	1.83	04/18/19 21:36	MLS 95-63-6	
1,2-Dibromoethane (EDB)	ND	ug/m3	1.4	1.83	04/18/19 21:36	MLS 106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.3	1.83	04/18/19 21:36	MLS 95-50-1	
1,2-Dichloroethane	ND	ug/m3	0.74	1.83	04/18/19 21:36	MLS 107-06-2	
1,2-Dichloropropane	ND	ug/m3	1.7	1.83	04/18/19 21:36	MLS 78-87-5	
1,3,5-Trimethylbenzene	ND	ug/m3	1.8	1.83	04/18/19 21:36	MLS 108-67-8	
1,3-Butadiene	ND	ug/m3	0.83	1.83	04/18/19 21:36	MLS 106-99-0	
1,3-Dichlorobenzene	5.1	ug/m3	2.3	1.83	04/18/19 21:36	MLS 541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	5.6	1.83	04/18/19 21:36	MLS 106-46-7	
2-Butanone (MEK)	16.2	ug/m3	5.4	1.83	04/18/19 21:36	MLS 78-93-3	
2-Hexanone	ND	ug/m3	7.5	1.83	04/18/19 21:36	MLS 591-78-6	
2-Propanol	6.7	ug/m3	4.5	1.83	04/18/19 21:36	MLS 67-63-0	
4-Ethyltoluene	ND	ug/m3	4.6	1.83	04/18/19 21:36	MLS 622-96-8	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.5	1.83	04/18/19 21:36	MLS 108-10-1	
Acetone	299	ug/m3	4.3	1.83	04/18/19 21:36	MLS 67-64-1	
Benzene	1.9	ug/m3	0.58	1.83	04/18/19 21:36	MLS 71-43-2	
Benzyl chloride	ND	ug/m3	4.8	1.83	04/18/19 21:36	MLS 100-44-7	
Bromodichloromethane	ND	ug/m3	2.5	1.83	04/18/19 21:36	MLS 75-27-4	
Bromoform	ND	ug/m3	9.7	1.83	04/18/19 21:36	MLS 75-25-2	
Bromomethane	ND	ug/m3	1.5	1.83	04/18/19 21:36	MLS 74-83-9	
Carbon disulfide	ND	ug/m3	1.2	1.83	04/18/19 21:36	MLS 75-15-0	
Carbon tetrachloride	ND	ug/m3	2.4	1.83	04/18/19 21:36	MLS 56-23-5	
Chlorobenzene	ND	ug/m3	1.7	1.83	04/18/19 21:36	MLS 108-90-7	
Chloroethane	ND	ug/m3	0.99	1.83	04/18/19 21:36	MLS 75-00-3	
Chloroform	ND	ug/m3	0.89	1.83	04/18/19 21:36	MLS 67-66-3	
Chloromethane	ND	ug/m3	0.78	1.83	04/18/19 21:36	MLS 74-87-3	
cis-1,2-Dichloroethene	ND	ug/m3	1.5	1.83	04/18/19 21:36	MLS 156-59-2	
cis-1,3-Dichloropropene	ND	ug/m3	1.7	1.83	04/18/19 21:36	MLS 10061-01-5	
Cyclohexane	ND	ug/m3	3.2	1.83	04/18/19 21:36	MLS 110-82-7	
Dibromochloromethane	ND	ug/m3	3.2	1.83	04/18/19 21:36	MLS 124-48-1	
Dichlorodifluoromethane	10.1	ug/m3	1.9	1.83	04/18/19 21:36	MLS 75-71-8	

SUPPLEMENTAL REPORT

Units Conversion Request



Pace Analytical Services, Inc.
 1700 Elm Street – Suite 200
 Minneapolis, MN 55414
 Phone: 612.607.1700
 Fax: 612.607.6444

ANALYTICAL RESULTS

Client: PASI-MNFLD-AIR
 Phone: 864-980-5092

Lab Project Number: 10469120
 Project Name: PRJ07786 19-01567 MPCA Freew

Lab Sample No: 10469120001
 Client Sample ID: FD-SB-07

ProjSampleNum: 10469120001
 Matrix: Air

Date Collected: 04/01/19 13:45
 Date Received: 04/01/19 16:20

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
Air							
Dichlorotetrafluoroethane	15.6	ug/m3	2.6	1.83	04/18/19 21:36	MLS 76-14-2	
Ethanol	33.5	ug/m3	3.4	1.83	04/18/19 21:36	MLS 64-17-5	
Ethyl acetate	ND	ug/m3	1.4	1.83	04/18/19 21:36	MLS 141-78-6	
Ethylbenzene	4.4	ug/m3	1.6	1.83	04/18/19 21:36	MLS 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/m3	10	1.83	04/18/19 21:36	MLS 87-68-3	
m&p-Xylene	17.7	ug/m3	3.2	1.83	04/18/19 21:36	MLS 179601-23-1	
Methylene Chloride	ND	ug/m3	6.4	1.83	04/18/19 21:36	MLS 75-09-2	
Methyl-tert-butyl ether	ND	ug/m3	6.6	1.83	04/18/19 21:36	MLS 1634-04-4	
Naphthalene	ND	ug/m3	4.9	1.83	04/18/19 21:36	MLS 91-20-3	
n-Heptane	3.5	ug/m3	1.5	1.83	04/18/19 21:36	MLS 142-82-5	
n-Hexane	3.4	ug/m3	1.3	1.83	04/18/19 21:36	MLS 110-54-3	
o-Xylene	5.7	ug/m3	1.6	1.83	04/18/19 21:36	MLS 95-47-6	
Propylene	10.8	ug/m3	0.65	1.83	04/18/19 21:36	MLS 115-07-1	
Styrene	ND	ug/m3	1.6	1.83	04/18/19 21:36	MLS 100-42-5	
Tetrachloroethene	18.6	ug/m3	1.2	1.83	04/18/19 21:36	MLS 127-18-4	
Tetrahydrofuran	ND	ug/m3	1.1	1.83	04/18/19 21:36	MLS 109-99-9	
Toluene	16.5	ug/m3	1.4	1.83	04/18/19 21:36	MLS 108-88-3	
trans-1,2-Dichloroethene	ND	ug/m3	1.5	1.83	04/18/19 21:36	MLS 156-60-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.7	1.83	04/18/19 21:36	MLS 10061-02-6	
Trichloroethene	ND	ug/m3	0.98	1.83	04/18/19 21:36	MLS 79-01-6	
Trichlorofluoromethane	11.4	ug/m3	2.1	1.83	04/18/19 21:36	MLS 75-69-4	
Vinyl acetate	ND	ug/m3	1.3	1.83	04/18/19 21:36	MLS 108-05-4	
Vinyl chloride	ND	ug/m3	0.47	1.83	04/18/19 21:36	MLS 75-01-4	

DISCLAIMER: These results have been converted to the units shown from the original units of measurement assuming 20 degrees Celsius and 1 atmosphere pressure. Values were not rounded according to EPA rounding rules. THC is quantitated based on the average response factors of several compounds; the nominal molecular weight of THC used for units conversion is the average of the molecular weights of the compounds used for quantitation.

SUPPLEMENTAL REPORT

Units Conversion Request



Pace Analytical Services, Inc.
 1700 Elm Street – Suite 200
 Minneapolis, MN 55414
 Phone: 612.607.1700
 Fax: 612.607.6444

ANALYTICAL RESULTS

Client: PASI-MNFLD-AIR
 Phone: 864-980-5092

Lab Project Number: 10469120
 Project Name: PRJ07786 19-01567 MPCA Freew

Lab Sample No: 10469120002
 Client Sample ID: FD-SB-08

ProjSampleNum: 10469120002
 Matrix: Air

Date Collected: 04/01/19 15:23
 Date Received: 04/01/19 16:20

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
Air							
TO-15							
1,1,1-Trichloroethane	ND	ug/m3	1.9	1.75	04/18/19 22:03	MLS 71-55-6	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.3	1.75	04/18/19 22:03	MLS 79-34-5	
1,1,2-Trichloroethane	ND	ug/m3	1	1.75	04/18/19 22:03	MLS 79-00-5	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.7	1.75	04/18/19 22:03	MLS 76-13-1	
1,1-Dichloroethane	ND	ug/m3	1.4	1.75	04/18/19 22:03	MLS 75-34-3	
1,1-Dichloroethene	ND	ug/m3	1.4	1.75	04/18/19 22:03	MLS 75-35-4	
1,2,4-Trichlorobenzene	ND	ug/m3	13.6	1.75	04/18/19 22:03	MLS 120-82-1	
1,2,4-Trimethylbenzene	7.5	ug/m3	1.7	1.75	04/18/19 22:03	MLS 95-63-6	
1,2-Dibromoethane (EDB)	ND	ug/m3	1.4	1.75	04/18/19 22:03	MLS 106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.1	1.75	04/18/19 22:03	MLS 95-50-1	
1,2-Dichloroethane	ND	ug/m3	0.74	1.75	04/18/19 22:03	MLS 107-06-2	
1,2-Dichloropropane	ND	ug/m3	1.6	1.75	04/18/19 22:03	MLS 78-87-5	
1,3,5-Trimethylbenzene	2.1	ug/m3	1.7	1.75	04/18/19 22:03	MLS 108-67-8	
1,3-Butadiene	ND	ug/m3	0.79	1.75	04/18/19 22:03	MLS 106-99-0	
1,3-Dichlorobenzene	3.2	ug/m3	2.1	1.75	04/18/19 22:03	MLS 541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	5.4	1.75	04/18/19 22:03	MLS 106-46-7	
2-Butanone (MEK)	ND	ug/m3	5.4	1.75	04/18/19 22:03	MLS 78-93-3	
2-Hexanone	ND	ug/m3	7.5	1.75	04/18/19 22:03	MLS 591-78-6	
2-Propanol	ND	ug/m3	4.5	1.75	04/18/19 22:03	MLS 67-63-0	
4-Ethyltoluene	ND	ug/m3	4.4	1.75	04/18/19 22:03	MLS 622-96-8	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	7.5	1.75	04/18/19 22:03	MLS 108-10-1	
Acetone	159	ug/m3	4.3	1.75	04/18/19 22:03	MLS 67-64-1	
Benzene	5.2	ug/m3	0.58	1.75	04/18/19 22:03	MLS 71-43-2	
Benzyl chloride	ND	ug/m3	4.6	1.75	04/18/19 22:03	MLS 100-44-7	
Bromodichloromethane	ND	ug/m3	2.4	1.75	04/18/19 22:03	MLS 75-27-4	
Bromoform	ND	ug/m3	9.2	1.75	04/18/19 22:03	MLS 75-25-2	
Bromomethane	ND	ug/m3	1.4	1.75	04/18/19 22:03	MLS 74-83-9	
Carbon disulfide	34.5	ug/m3	1.1	1.75	04/18/19 22:03	MLS 75-15-0	
Carbon tetrachloride	ND	ug/m3	2.2	1.75	04/18/19 22:03	MLS 56-23-5	
Chlorobenzene	ND	ug/m3	1.6	1.75	04/18/19 22:03	MLS 108-90-7	
Chloroethane	ND	ug/m3	0.94	1.75	04/18/19 22:03	MLS 75-00-3	
Chloroform	ND	ug/m3	0.89	1.75	04/18/19 22:03	MLS 67-66-3	
Chloromethane	6.1	ug/m3	0.73	1.75	04/18/19 22:03	MLS 74-87-3	
cis-1,2-Dichloroethene	16.1	ug/m3	1.4	1.75	04/18/19 22:03	MLS 156-59-2	
cis-1,3-Dichloropropene	ND	ug/m3	1.6	1.75	04/18/19 22:03	MLS 10061-01-5	
Cyclohexane	ND	ug/m3	3.1	1.75	04/18/19 22:03	MLS 110-82-7	
Dibromochloromethane	ND	ug/m3	3	1.75	04/18/19 22:03	MLS 124-48-1	
Dichlorodifluoromethane	65.9	ug/m3	1.8	1.75	04/18/19 22:03	MLS 75-71-8	

SUPPLEMENTAL REPORT

Units Conversion Request



Pace Analytical Services, Inc.
 1700 Elm Street – Suite 200
 Minneapolis, MN 55414
 Phone: 612.607.1700
 Fax: 612.607.6444

ANALYTICAL RESULTS

Client: PASI-MNFLD-AIR
 Phone: 864-980-5092

Lab Project Number: 10469120
 Project Name: PRJ07786 19-01567 MPCA Freew

Lab Sample No: 10469120002
 Client Sample ID: FD-SB-08

ProjSampleNum: 10469120002
 Matrix: Air

Date Collected: 04/01/19 15:23
 Date Received: 04/01/19 16:20

Parameters	Results	Units	Report Limit	DF	Analyzed	CAS No.	Qualifiers
Air							
Dichlorotetrafluoroethane	76.7	ug/m3	2.5	1.75	04/18/19 22:03	MLS 76-14-2	
Ethanol	7.1	ug/m3	3.4	1.75	04/18/19 22:03	MLS 64-17-5	
Ethyl acetate	ND	ug/m3	1.3	1.75	04/18/19 22:03	MLS 141-78-6	
Ethylbenzene	4.4	ug/m3	1.5	1.75	04/18/19 22:03	MLS 100-41-4	
Hexachloro-1,3-butadiene	ND	ug/m3	9.5	1.75	04/18/19 22:03	MLS 87-68-3	
m&p-Xylene	15.9	ug/m3	3.1	1.75	04/18/19 22:03	MLS 179601-23-1	
Methylene Chloride	ND	ug/m3	6.4	1.75	04/18/19 22:03	MLS 75-09-2	
Methyl-tert-butyl ether	ND	ug/m3	6.6	1.75	04/18/19 22:03	MLS 1634-04-4	
Naphthalene	ND	ug/m3	4.7	1.75	04/18/19 22:03	MLS 91-20-3	
n-Heptane	66.2	ug/m3	1.5	1.75	04/18/19 22:03	MLS 142-82-5	
n-Hexane	180	ug/m3	1.3	1.75	04/18/19 22:03	MLS 110-54-3	
o-Xylene	5.7	ug/m3	1.5	1.75	04/18/19 22:03	MLS 95-47-6	
Propylene	310	ug/m3	0.61	1.75	04/18/19 22:03	MLS 115-07-1	E
Styrene	ND	ug/m3	1.5	1.75	04/18/19 22:03	MLS 100-42-5	
Tetrachloroethene	35.2	ug/m3	1.2	1.75	04/18/19 22:03	MLS 127-18-4	
Tetrahydrofuran	ND	ug/m3	1	1.75	04/18/19 22:03	MLS 109-99-9	
Toluene	16.9	ug/m3	1.3	1.75	04/18/19 22:03	MLS 108-88-3	
trans-1,2-Dichloroethene	ND	ug/m3	1.4	1.75	04/18/19 22:03	MLS 156-60-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.6	1.75	04/18/19 22:03	MLS 10061-02-6	
Trichloroethene	35.5	ug/m3	0.98	1.75	04/18/19 22:03	MLS 79-01-6	
Trichlorofluoromethane	ND	ug/m3	2	1.75	04/18/19 22:03	MLS 75-69-4	
Vinyl acetate	ND	ug/m3	1.3	1.75	04/18/19 22:03	MLS 108-05-4	
Vinyl chloride	1.2	ug/m3	0.47	1.75	04/18/19 22:03	MLS 75-01-4	

DISCLAIMER: These results have been converted to the units shown from the original units of measurement assuming 20 degrees Celsius and 1 atmosphere pressure. Values were not rounded according to EPA rounding rules. THC is quantitated based on the average response factors of several compounds; the nominal molecular weight of THC used for units conversion is the average of the molecular weights of the compounds used for quantitation.

SUPPLEMENTAL REPORT

Units Conversion Request



Pace Analytical Services, Inc.
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Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

ANALYTICAL RESULTS

Client: PASI-MNFLD-AIR
Phone: 864-980-5092

Lab Project Number: 10469120
Project Name: PRJ07786 19-01567 MPCA Freew

PARAMETER FOOTNOTES

ND Not detected at or above adjusted reporting limit

NC Not Calculable

J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

[E] Analyte concentration exceeded the calibration range. The reported result is estimated.

SUPPLEMENTAL REPORT

Units Conversion Request